WESTERN RENEWABLE ENERGY GENERATION INFORMATION SYSTEM (WREGIS)

FEASIBILITY STUDY REPORT

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California Energy Commission

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CALIFORNIA
ENERGY
COMMISSION

Western Renewable Energy Generation Information System (WREGIS)

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October 22, 2005

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Arnold Schwarzenegger,
Governor

WREGIS FSR

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3.1 Business Program Background

Renewable Energy Program

Renewable energy generation has been a key element of California's energy policy since the inception of the California Energy Commission (Energy Commission) in 1974. The public benefits of diversification of the energy base used for power generation include:

- Electricity price stabilization through increased use of non-traditional and secure energy resources;
- Reduced air pollution from use of non-polluting resources;
- Economic stimulation through development of indigenous resources;
- Increased system reliability through distributed generation;
- Reduced reliance on fossil fuels and imported fuels; and,
- Increased use of sustainable resources.

After decades of bi-partisan legislative and gubernatorial support for renewable energy, California is a recognized leader in the field. The Energy Commission's Renewable Energy Program was formalized in 1996 to help increase total renewable energy production statewide.

Assembly Bill 1890 (AB 1890, Brulte, Chapter 854, Statues of 1996), enacted in 1996, restructured California's electricity markets. Pursuant to AB 1890 the electricity market moved from the traditional structure of electricity being generated, distributed, and sold to customers by regulated utilities to a more competitive market in which the functions of power generation and retail sales were allowed to be provided by non-utility entities. As a result of AB 1890's deregulation, companies termed Electric Service Providers (ESPs) came into existence. An ESP registered with the California Public Utilities Commission (CPUC), and bonded, was allowed to market electricity directly to consumers.[1] Utilities were encouraged to divest their older natural gas-fired power plants to non-regulated independent power producers. These so-called Non-utility Generators (NUGs) were conceived as private companies that would generate and sell power in a highly competitive wholesale power market.

AB 1890 also created a Public Goods Charge (PGC) to ensure that key activities in the

[1] At this juncture, 18 ESPs are registered to do business in California, although on September 20, 2001 the CPUC removed ESPs authorization to acquire new customers. At that time, regulated utilities struggled to obtain electricity supplies adequate to meet their customer's demand, prices began rising. The CPUC was concerned that if a large number of utility customers were allowed to obtain electricity from other suppliers to avoid high utility prices, the remaining utility customers would see even higher costs since they would face paying for the costs incurred by utilities on behalf of the departing customers. ESPs were allowed to continue service to existing customers.

regulated market continued in the deregulated market. Funds from the Public Goods Charge in the amount of $135 million per year were allocated to continue development of renewable energy generation in the deregulated market.[2]

The Energy Commission developed and oversees the current Renewable Energy Program that allocates the $135 million across the accounts mentioned in footnote 2. The current program provides market-based incentives for new and existing utility-scale facilities powered by renewable energy. It offers consumer rebates for those installing new distributed renewable energy systems. The program also helps educate the public regarding renewable energy.

Renewables Portfolio Standard

Senate Bill 1078 (SB 1078, Sher, Chapter 516, Statues of 2002) created California's Renewables Portfolio Standard (RPS).[3] The RPS requires retail sellers of electricity to increase the renewable content of their electricity sales by a minimum of one percent of total retail sales per year beginning in 2003. The intent is to achieve an electricity portfolio in California in which 20 percent of the electricity retail sales will be served with renewable energy by December 31, 2017.

California's energy policy "accelerates" the RPS schedule to a target of 2010 rather than 2017. The 2010 target was formally adopted in a joint agency report, the *Energy Action Plan* adopted by the California Energy Commission, the CPUC, and the California Power Authority in the spring of 2003.[4] The accelerated RPS goal adopted in the Energy Action Plan is incorporated in the CPUC Order Instituting Rulemaking 04-04-026. The RPS rulemaking states, "…we encourage the utilities to procure cost-effective renewable generation in excess of their [annual procurement targets] for this year, in order to make progress towards the goal expressed in the [Energy Action Plan.]"

In the *2003 Integrated Energy Policy Report (Energy Report),* the Energy Commission confirmed support for the target of 20 percent by 2010 and concluded that more ambitious, longer-term goals may be warranted for the post-2010 period.[5] It should also be noted that SB 1078 directs the publicly owned electric utilities to develop RPS

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[2] The Legislature initially set the funding to be collected for a four-year period from January 1998 to January 2002. SB 90 (Chapter 905, Statutes of 1997) established the Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund, and four distinct "accounts" for the deposit of the PGC. In 2000, the Legislature extended collection of the PGC through 2011, under AB 995 (Chapter 1051, Statutes of 2000) and SB 1194 (Chapter 1050, Statutes of 2000). SB 1038 (Chapter 515, Statutes of 2002) extended the Energy Commission's authority to implement the Renewable Energy Program and continue distributing the PGC.

[3] Senate Bill 67 (Chapter 731, Statutes 2003) and Senate Bill 183 (Chapter 666, Statutes 2003) modify California's RPS and provide clarification on out of state eligibility.

[4] California Power Authority, California Energy Commission, and California Public Utilities Commission, May 2003, *Energy Action Plan*.

[5] California Energy Commission, *2003 Integrated Energy Policy Report,* Publication number 100-03-019, docket 02-IEP-1, December 2003.

programs consistent with the intent of the legislature, taking costs and the goal of environmental improvement into account. The *2003 Energy Report* recommended that the RPS be mandatory for all retail sellers, including publicly owned electric utilities. The Governor strongly endorses the accelerated RPS goal of 20 percent by 2010 and in addition would like to see 33 percent renewables by 2020, not just for IOUs but also for municipal utilities.[6]

To achieve the RPS goals, retail sellers must stimulate new investment in renewable energy resources since only about 12 percent of electricity now used in California comes from renewable energy sources. The new investment will be made either by third-party, non-utility developers who contract for electricity deliveries, or by direct investment in new renewable energy projects. The RPS requires the Investor Owned Utilities (IOUs) to hold competitive solicitations to procure renewable energy through long term contracts. Fostering long term contracts between retail sellers and renewable generators addresses one of the key challenges that stalled the development of new renewable energy facilities in recent years. Renewable energy facilities tend to have high up-front capital costs and low fuel prices, this combination makes securing a long term contract vital for developers seeking financing.

The RPS is intended to ensure that the public benefits of renewable-based energy resources (e.g., wind, solar, biomass, and geothermal) continue to be achieved and encourage the expansion of these resources. The current electricity market does not place a value on the public benefits obtained through use of renewable-based electricity. The RPS helps compensate developers for the current market externality by requiring that a minimum amount of renewable energy is included in the portfolio of electricity resources serving California. And, by increasing the required amount over time, the RPS puts the renewable energy industry on a path of increasing sustainability.

The Renewable Energy Program is working with the CPUC to implement the RPS. One of the Energy Commission's roles in RPS implementation is to distribute PGC funds to support generation from new and repowered renewable facilities eligible for the RPS. The Energy Commission administers funds from the PGC in support of the RPS by providing Supplemental Energy Payments[7] (SEPs) to compensate renewable generators that have market costs in excess of what the utility would pay for a comparable fixed, long term contract with a natural gas facility (the estimated price for a long term contract with a natural gas facility is termed the "Market Price Referent"). The eligible renewable generator may receive the sum of the Market Price Referent paid by the utility and the SEP paid by the Energy Commission. Renewable generators are only eligible for SEPs if they are awarded a long term contract through a utility's competitive RPS solicitation (the long term contracts are 10, 15, or 20 years).

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[6] Governor Schwarzenegger's veto message for Senate Bill 1478, Sher, 2004. http://www.governor.ca.gov/govsite/pdf/vetoes/SB_1478_veto.pdf

[7] Supplemental Energy Payments are incentive payments from the Energy Commission to eligible renewable energy generators to defray costs above the market price referent for energy procured to meet the RPS, pursuant to PUC section 399.15 (a) (2).

SB 1078 mandates that the Energy Commission track renewable energy transactions to verify compliance with the RPS. Pursuant to SB 1078, the Energy Commission is required to do the following:

1. Design and implement an accounting system[8] to verify compliance with the renewables portfolio standard by retail sellers;
2. Ensure that renewable energy output is counted only once for the purpose of meeting the renewables portfolio standard *of this state or any other state*; and
3. Verify retail product claims *in this state or any other state*.

SB 1078 directs that "…the Energy Commission shall collect data from electricity market participants that it deems necessary to verify compliance of retail sellers, in accordance with the requirements of this article and the California Public Records Act."[9]

Renewable Energy Certificates

A Renewable Energy Certificate (REC) represents the environmental attributes of renewable energy as a separate commodity from the electricity. A REC represents the right to claim the purchase of the benefits associated with the "renewableness." A REC is created when one (1) Megawatt hour (MWh) of renewable energy is generated. A REC may be "bundled" with the underlying electricity or sold separately ("unbundled").

RECs serve various programs, including:

- Renewable Portfolio Standards;
- Retail Product Claims (such as Power Source Disclosure);
- Green Pricing; and,
- Voluntary Markets.

A REC is a separate attribute from the electricity itself. In this report, the term REC is used in its broadest definition to mean the attributes of a given unit of renewable-based generation, as distinct from the underlying electrical energy.

RECs may be traded separately from the underlying energy. RECs allow the renewable energy attribute to be separated in time and geographic location from the electricity that is produced, providing more flexibility for generators and retail providers. Unbundled RECs have been used in California and in other states. In California, unbundled RECs have been accepted at the wholesale level in the Customer Credit Program[10] as well as

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[8] Other comparable systems operating within the US refer to such a system as a "renewable energy generation tracking and registry system." The term used in this feasibility study is "tracking and registry system."

[9] Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code.

[10] Under SB 90, the Customer Credit Program was designed to reduce the premium customers paid for renewable energy and thus stimulate market demand. The Customer Credit Program was discontinued in April 2003.

the Power Source Disclosure Program.[11] In other states, RECs have been used to meet RPS obligations. RECs are also being sold at the retail level in many parts of the United States.[12] However, unbundled RECs are not currently accepted for the purposes of California's RPS.[13]

With RECs, a retail seller of electricity could purchase the renewable attributes for a given amount of eligible generation and not have to match that electrical energy with demand they serve at a specific time. Compliance with an RPS, or retail product claims could be met by demonstrating that the retail seller owns sufficient RECs to meet their annual obligation. Similarly, a retail seller could purchase RECs from a facility that geographically is located such that transmission to the retail seller's load is difficult or expensive.

The rapid adoption of RECs for regulatory and commercial purposes stems, in part, from the mismatch of renewable generation and consumption profiles. Because most renewable energy requirements (and customer demands for renewable-based electricity) require only an annual compliance demonstration, a minute-by-minute match of renewable generation and consumption is unnecessary. RECs provide a mechanism for accounting for renewable energy generation that compensates for the fact that electricity cannot be easily stored to match a specific customer's load profile and that some renewable resources are intermittent. Thus RECs can be "deposited" in the generators account when created and "withdrawn" as traded to retail sellers. Banking can occur on any time scale that regulators deem appropriate for their state or province.

Retail suppliers could purchase RECs when they purchase renewable energy, or they could purchase RECs separately either directly from an eligible renewables-based generator, a REC broker, or any other seller of RECs. A retail seller of power may have purchased renewable energy in excess of its RPS obligation. In such a case, the REC may

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[11] Under the Power Source Disclosure Program, all utilities in California are required to report the source of electricity sold to consumers. Sources are classified by broad categories including nuclear, coal, renewable, hydroelectric, and others.

[12] The western interconnected power grid may be thought of as a large "pool." Generators produce electricity that goes into the "pool," and consumers draw electricity from the "pool." Power grid managers, such as the Cal ISO, ensure that the level of electricity in the "pool" stays within prescribed levels, that is, electricity supply is closely matched to demand in real-time. Electricity from all generator sources is mixed in the "pool." An individual consumer, except under unusual and very specific circumstances, does not have a direct link to a specific electricity source. The RPS requires that a certain amount of renewable energy be produced and added to the "pool." The mechanism of RECs assures that the required amount of renewable energy has been produced. A retail seller need not be concerned with the location of the generator or type of renewable-based electricity: their possession of the necessary RECs to meet the RPS means they have supported a certain amount of renewable-based generation somewhere in the Western Interconnection.

[13] Before unbundled RECs are considered for adoption for purposes of California's RPS, the California Public Utilities Commission "will need a clear showing that a REC trading system would be consistent with the specific goals of SB 1078, would not create or exacerbate environmental justice problems, and would not dilute the environmental benefits provided by renewable generation."–California Public Utilities Commission Decision 03-06-071, June 19, 2003, pp. 9-10.

be resold to another retail seller with insufficient RECs to meets its RPS need. The RPS and the existence of an unbundled REC will have stimulated renewable energy generation equivalent to the RPS requirement of both retail sellers.

RECs and California's RPS

The central element of the RPS verification process required by SB1078 is the use of Renewable Energy Certificates (RECs) bundled with the underlying electricity. A REC is typically denominated in Megawatt-hours (MWhs). A REC is created when:

1. A qualifying renewable energy resource is used to generate 1 MWh of electricity;
2. That MWh is ultimately consumed in California or other Western Interconnection[14] states or provinces overseen by the Western Electricity Coordinating Council[15] (WECC); and,
3. A satisfactory verification, or certification, of (1) and (2) is made.

Ownership of sufficient RECs provides the means for demonstrating compliance with renewable portfolio standards, and other renewable policies. RECs provide a cost-reducing alternative to monitoring compliance with an RPS compared to reliance on tracking the contract paths of power purchases from renewable energy generators.

As previously mentioned, in California, current policies do not allow the RECs to be sold separately from the underlying electricity. However, the use of an automated tracking and registry system to track the environmental attributes has considerable cost efficiency, accuracy, and credibility advantages over a contract-path based tracking and registry system.

One of the greatest advantages of an electronic system is that it can establish property rights for each MWh of electricity. Under contract-path based accounting, regulators can only verify that the claims made against a particular generator do not exceed the actual production by that generator, there is no guarantee that a particular MWh (represented by a REC) has not been counted twice.

Western Renewable Energy Generation Information System

The California Legislature has charged the Energy Commission with developing a

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[14] The Western Interconnection is the geographic area containing the synchronously operated electric transmission grid in the western part of North America, which includes parts of Montana, Nebraska, New Mexico, South Dakota, Texas, Wyoming, and Mexico and all of Arizona, California, Colorado, Idaho, Nevada, Oregon, Utah, Washington, and the Canadian Provinces of British Columbia and Alberta.

[15] The WECC is one of four regional organizations that oversee the operation of the nation's bulk power grid. The WECC serves to ensure that generators and operators of high voltage power transmission lines comply with the operating rules and regulations of the National Electricity Reliability Council (NERC). The NERC was formed by the U.S. electricity power industry following the Northeast power blackout in 1967. The WECC oversee the geographic area of the eleven contiguous western states, two Canadian provinces, and portions of Northern Mexico.

tracking and registry system for implementing California's Renewables Portfolio Standard. The Western Governors' Association[16] (WGA) and the Energy Commission are working to develop a system that can be utilized throughout the West: the Western Renewable Energy Generation Information System (WREGIS). The fundamental goal of WREGIS is to ensure that regulators have the information they need to determine compliance with their policies and programs and that allows market participants to confidently transact business involving RECs. To the extent that WREGIS is capable of meeting Western needs in general, it will lower the cost of demonstrating compliance with California RPS requirements, and increase the accuracy of verification.

The WGA, with assistance from the Energy Commission, recently surveyed regulators, utilities, market participants, tribes, developers, and other stakeholders, to solicit input on the requirements of a Western tracking and registry system.[17] The WGA and the Energy Commission concluded that a tracking and registry system, composed of an automated solution with supporting technical and operations staff, should have the following general characteristics:

1. *Voluntary.* Participation in the WREGIS will be voluntary. Some states, however, may require participation in WREGIS to demonstrate compliance with a particular state regulatory program.

2. *Flexibility.* WREGIS should have the ability to support a variety of public policies and voluntary renewable markets.

3. *Policy-neutral.* As a general rule, WREGIS should be policy-neutral to the extent possible. It is primarily a tracking and registry system that issues certificates to generators, tracks certificate ownership, and retires certificates when they are used for compliance or to support marketing claims. Issues related to eligibility of RECs for a particular policy mandate will be left to state policy makers or regulators to manage at the individual state level.

4. *Volume.* WREGIS should offer sufficient value to participants so that it attracts many users. High system volume will help spread out operational costs, but more importantly, greater volume enables competitive markets and REC liquidity, which can lead to lower REC prices for end-users. Further, it fosters market credibility to the benefit of consumers and producers.

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[16] The WGA is a voluntary organization composed of governors of western states including Hawaii and two U.S. pacific territories. The WGA addresses important policy and governance issues in the West and advances western views in federal forums. WGA develops policy and carries out programs in the areas of natural resources, the environment, human services, economic development, international relations and state governance. A key element of WGA's strategic agenda for 2004 is "Strengthening State and Federal Energy Policy and Systems."

[17] Over 340 stakeholders, including participants from 11 western states and 2 Canadian provinces, have participated in the requirements definition process. Stakeholder involvement has included the 2003 Needs Assessment survey and report which represents findings from the survey, seven stakeholder meetings, and ongoing participation in three working committees developing recommendations for WREGIS functionality, institutional home and governance structure.

5. *Geographic Scope.* WREGIS will operate in the geographic region defined by the Western Interconnection. Since the Western Interconnection does not follow state boundaries, some states are divided by the Western Interconnection boundaries. To the extent it is possible, WREGIS has a goal of allowing facilities to participate in WREGIS even if they are located in the portion of individual states that are outside the Western Interconnection boundaries.

6. *Low User Costs.* The level of user fees will be critical to participation by generators, wholesale suppliers, renewable marketers, utilities, and others.

7. *Market-neutral*. WREGIS must be credible to all users and observers. In order to maintain credibility, tracking and accounting will remain separate from any actual markets that may develop to trade RECs. The tracking and registry system administrator will be independent of the market and not in a position to gain financially from the activity being monitored. Private companies can and do provide necessary market-making functions already, and the Energy Commission and WGA believe that such functions should be left to the market to provide.

The criteria for a REC may be different between Western Interconnection states and provinces. Because WREGIS is policy neutral, WREGIS will issue WREGIS Certificates in place of RECs. WREGIS Certificates will allow states and provinces to apply their own policy criteria to differentiate among various energy sources used to generate renewable energy-based electricity.

WGA and the Energy Commission agreed on the following goals of WREGIS:

1. Assign a single entity in the West to issue, register and track RECs for use in verification of compliance with state regulatory and voluntary market programs.

2. Develop standard definitions, rules, and operating guidelines for participants in WREGIS.

3. Improve profitability for the region's renewable energy resources by:

    - Maximizing value of renewable energy generation;
    - Increasing efficiency of renewable energy markets;
    - Expanding the marketplace for renewable energy generated in the West;
    - Mitigating problems of geographic proximity, intermittency and load matching;
    - Preventing multiple counting and selling; and,
    - Increasing verified renewable energy options for consumers.

- Support state regulatory programs such as:

    - RPS, Green Pricing, Retail Product Claims for load serving entities, utilities, and power marketers; and,
    - Air Quality, Regional Haze, and State Implementation Plans.

Currently, there are three operational tracking and registry systems in the United States that issue and track renewable certificates and, more broadly, generation attribute certificates: 1) the Texas RECs Program, 2) the Wisconsin Renewable Resource Credit program, and 3) the NEPOOL Generation Information System. In addition, there are well-established certificate tracking and registry systems in Europe and Australia. All existing systems are computer-based, and largely automated due to the sheer volume of RECs that are created and traded.

3.2 Business Problem or Opportunity

Problems

Manual verification of RPS compliance is infeasible. Verification occurs up to one year after the electrical generation has occurred to allow for settlement adjustments. To date, one Energy Commission staff person has spent in excess of 60 hours over a three-month period in an attempt to verify the 436 Investor Owned Utility (IOU) claims made in the 2001 and 2002 time periods for annual procurement of renewable electricity. To date, this verification has not been completed. The 436 claims represent procurement of 18,200 GWh, which would be equivalent to 18.2 million certificates. In addition, it would be extremely difficult to manually discern property rights in the event that claims made by utilities exceeded the amount of renewable energy generated by the generator.

The Energy Commission staff projects that achieving the 20 percent renewable target by the three IOUs in 2017 would mean about 39,600 GWh which equates to 39.6 million individual certificates that may change ownership several times during the period for which compliance is being measured. Assuming the 20 percent target is met statewide in 2017, the volume of RECs would reach 62.9 million certificates. The state is committed to the more accelerated goal of 20 percent by 2010,[18] however, and as such the need to track such volumes of RECs is also accelerated. In light of the problems encountered in verifying only RPS claims made to date, verification of nearly 63 million by manual means is simply infeasible.

Existing Data Sources are inadequate for RPS compliance verification. The Energy Commission has received data for 2003 in June of 2004. IOUs self-report the renewable electricity they procure each year via an Excel spreadsheet. Energy Commission staff must reconcile this data using multiple databases:

- Energy Information Administration (EIA) database which includes self-reported energy generated by owner/operators.
- Energy Commission's Electricity Analysis Office database, which include power plant output and other characteristics that are voluntary and self-reported by the owners/operators of plants within California.

[18] California Energy Commission, Accelerated Renewable Energy Development, prepared in support of the 2004 Integrated Energy Policy Report Update Proceeding (03-IEPR-01), Staff White Paper, publication number 100-04-003, July 30, 2004.

- Energy Commission's Renewable Energy Program databases (existing and new) that include utility provided Statements of Capacity and Electric Energy Purchased and are considered to be third party statements.
- Western States Tracking System used to verify self-reported power source disclosure for electricity generating facilities in Oregon and Washington using the EIA database. This system represents information from a variety of federal data sources. The system allows California, Oregon, and Washington regulators to verify that the total amount of electricity claimed in all three states does not exceed the total amount generated from a given facility.

The Energy Commission staff compares the generation data (available through the database listed above) with the claims reported by the IOUs for compliance with RPS. To the extent that one generator sells its renewable energy to more than one IOU, staff must manually add the purchases from each IOU to calculate the cumulative amount sold by a generator. This is necessary to verify that the total claims made about RPS procurement do not exceed the amount of energy generated per generator.

Of the 436 claims made by the three IOUs for 2001 and 2002, 163 claims (37 percent) could not be verified using the above data sources. The Energy Commission cannot confirm that the amount claimed by the utility has actually been generated in many cases. Even of the generation claims that were verified, 25 percent (109 claims) are over-claimed, meaning that the utility claimed that they purchased more from the generator than the generator was reported to have produced, given the available data. In particular, of the 109 claims that were over-claimed, 54 claims were off by more than 10 percent (12 percent of the total claims fall into this category).

Generators Listed by the IOUs	Number	Percent of Total Claims
Total Number of Generators Claimed	436	100
Total Number of Generators Verified	273	63
Total Number of Generators Not Verified	163	37
Total Number of Generators that Were Over-claimed	109	25
Total Number of Over-claimed with a Discrepancy > 10 %	54	12

Even in the cases where data were available, the amount of renewable energy claimed did not always match the amount generated. Energy Commission staff recognizes that these discrepancies may result from inconsistencies between data sets such as differences in reporting cycles or other parameters. Tracking IOU procurement of renewable energy to the generation source is inefficient and imprecise.

A minimal and intermittent process is used to verify the amount of renewable energy generated. There has not been a procedure in place for verifying that what the

generators self-report to the various databases are correct, which includes fuel type used by the generator. At this time, it is not known how much of the renewable energy purchased by the IOUs in 2001, 2002, or 2003 came from "eligible" suppliers, since the certification process is in the beginning phase of implementation and most supplier have not been certified.

System does not clearly delineate property rights. Under the Interim Tracking System, verification of procurement and subsequent reconciliation with generation data occurs annually. Since staff's annual analysis typically occurs months after energy is generated and procured, any discrepancies in the data need to be resolved after the fact. If staff identifies a situation in which it appears more than one IOU claims to have procured energy from one generator, and the total claims exceed the total generation from that generator, the discrepancy would be identified months after the transaction took place. Resolving such discrepancies is time consuming. With WREGIS, such potential discrepancies can be avoided, or readily identified.

WREGIS assigns a unique serial number to each WREGIS certificate (1 certificate represents 1 MWh of renewable generation) issued at the time the energy generation data are available. WREGIS also accounts for transfer of ownership, so in the event there are two IOUs procuring energy from the same generator and the total claims exceed total generation, WREGIS will be able to identify where the discrepancy has occurred by reviewing account information for each of the IOUs.

Current voluntary methods to identify and certify renewable energy are not verifiable. In 2001, the Certificates of Specific Generation Program was adopted into regulation under the auspices of the Power Source Disclosure Program (PSDP), a statutorily mandated activity. The Certificates of Specific Generation Program was designed by the Energy Commission to document "specific purchases" under the law that requires retailers to disclose their generation sources. Certificates of Specific Generation are unique documents that a generator can create with free Energy Commission software called GenReport. Using the software, the generator reports its net output quarterly to the Energy Commission while at the same time creating certificates that represent the right to assign power sold to consumers to the facility named on the certificate. The certificate contains all the information necessary for a retailer to support a claim that electricity it sold to consumers is attributable to the named plant for purposes of a power content label. The Certificates of Specific Generation Program software creates physical certificates that may then be sold or transferred to another party. Again, these data are self-reported by the generators and there are no verification mechanisms in place to verify that a generator has generated the amount reported. Documentation of compliance is non-uniform: currently it is a mix of GenReport certificates and individual parties' unique contract trails. In addition, there is no guarantee that double counting is being prevented. Using a mix of contract-path based accounting (manual) systems and GenReport certificates is inconsistent with the guidelines set forth by the National Association of Attorneys General Office.[19]

[19] The Environmental Marketing Subcommittee of the National Association of Attorneys General's Energy Deregulation Working Group, Preliminary Draft of "Environmental Marketing Guidelines for Electricity,"

Opportunities

SB 1078 creates an opportunity to increase the accuracy of verification efforts to determine compliance with the RPS, to make the renewable energy market more efficient, to stimulate growth in that market, and to potentially reduce or eliminate the need for SEPs as renewable energy generation technology improves and the market expands.

There is a growing recognition among policy-makers and regulators that tracking and accounting of renewable energy generation is critical to verification of compliance with various policy mandates, and for consumer protection in voluntary green power markets.[20] A fully functional WREGIS would enable accurate accounting of renewable energy generation; and by fostering development of a robust and credible REC market increase the likelihood that California will capture the benefits inherent in renewable energy generation.

In addition, the Western Interconnection regional benefits of WREGIS include the following: 1) the simplification and verification of REC transfers across states and provinces to meet renewable policy needs; and, 2) the broader distribution of operational costs which result in an increased number of WREGIS users. WREGIS is seen as the most cost-effective way to meet the needs of renewable energy policies throughout the Western Interconnection.

With the adequacy of California's current electricity supply in question, particularly in periods of high summer demand, increasing the amount of renewable generation in California in the near-term will provide important benefits. In the long term, sustained increases in California's renewable energy generation will help stabilize supply and provide increasing environmental benefits.

3.3 Business Objectives

California's RPS has the public policy goal of efficiently maintaining California's existing renewables market, while encouraging its growth. As noted, SB 1078 requires the Energy Commission to design and implement a tracking and registry system to verify retail seller's compliance with the RPS. The business objectives of the mandated tracking and registry system are:

1. Within one year after implementation, increase consumer confidence by ensuring

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May 24, 1999 in section: 2. General Principles, (b) Substantiation states, "To avoid selling the same power or the same environmental attributes of power, more than once, only one system of substantiation (such as auditable contract paths or a single system of tradable certificates) should be used. The Attorneys General take no position on which system of substantiation—auditable contract paths, tradable certificates, or some other system—states should adopt." They reinforce this later with, "Moreover, to reduce the likelihood that the same power will be sold more than once, only one system of substantiation (such as auditable contract paths) should be used in the relevant region."

[20] A voluntary green power market is one in which a consumer elects to purchase electricity from renewable-energy based sources. The consumer may choose a percentage of electricity from zero to 100 percent of his or her consumption as coming from renewable sources.

that the renewable energy that is claimed by generators and distributed generation does not exceed what is actually produced with a verification rate of 95 percent or greater.

2. Within six months after implementation, ensure that 100 percent of renewable energy output tracked using WREGIS is counted only once for the purpose of any renewable policy.
3. Within six months after implementation, ensure that property rights are established for 100 percent of renewable energy output tracked using WREGIS.
4. Within one year of implementation, track 100 percent of the amount of renewable energy produced that is receiving Supplemental Energy Payments (SEP) from the Energy Commission, assuming payments begin within one year of system implementation[21].
5. Within one year of implementation, provide the information necessary to verify renewable energy claims from renewable generation facilities comply with renewable policies (for example: retail product claims, RPS, green pricing, etc.) and regulations for the participating Western Interconnection states and provinces.
6. Meet these objectives at the lowest possible cost.

3.4 Business Functional Requirements

The functional requirements presented here have been organized into categories corresponding to the primary business processes that must be supported in order to meet the WREGIS business objectives. The majority of these categories focus on the information system's functional requirements. One category describes the requirements associated with the system's technical and administrative operations and program support (Staffing and Training).

The table below briefly describes the type of requirements included in each category.

Category of Requirement	Category Description	Business Objectives Supported
1. Account Holder Registration and Updates (Figure 1)	Provide the means for a generator, retail seller or other market participant to electronically register as a WREGIS Account Holder and to maintain account information.	3, 6
2. Generating Unit Registration and Updates (Figure 2)	Provide the means for a WREGIS Account Holder who owns or manages generating facilities to register a generating unit within WREGIS and	1, 2, 3, 4, 5

[21] According to SB 1038 (Statutes, 2002).

Category of Requirement	Category Description	Business Objectives Supported
	maintain generating unit information on previously registered units so that the electricity generated by registered units can serve as the basis for creating WREGIS Certificates.	
3. Establish and Maintain WREGIS Subaccounts	Provide an account and subaccount structure allowing Account Holders to establish, maintain, and customize accounts and subaccounts to manage their WREGIS Certificate transactions in a manner that best supports their business and compliance reporting needs.	2, 3, 6
4. Create and Deposit WREGIS Certificates (Figures 3 and 4)	Create and deposit WREGIS Certificates representing each whole MWh of renewable electricity generation into Account Holders accounts and subaccounts based on the accumulation of energy generation data reported by external entities or imports of renewable energy certificate data from external compatible tracking and registry systems.	1, 2, 3, 4, 5
5. Manage WREGIS Certificates (Figure 5)	Allow Account Holders to define and execute one-time and recurring transactions to transfer, retire, reserve or export WREGIS Certificates to demonstrate compliance with RPS and other renewable energy programs or to support other business needs.	1, 2, 3, 4, 5
6. Access Assignments and Updates	Allow authorized WREGIS technical and administrative operations staff to assign and maintain WREGIS system access and permissions for Account Holders and authorized others.	3.6
7. Report on WREGIS Data and Related Features	Support public access to standard, non-confidential internet-based WREGIS reports as well as Account Holder access to private reports containing confidential WREGIS data for Account Holder use or distribution to regulatory programs and other authorized third parties.	5, 6
8. Data Interfaces	Provide data interfaces for importing	1, 2, 3

Category of Requirement	Category Description	Business Objectives Supported
	electricity generation data via individual interfaces with external reporting entities (e.g., Control Areas) as well as WREGIS-supplied data entry screens for those entities reporting smaller volumes of electricity generation (e.g., customer-sited generation). Providing interfaces for import and export of certificate data between WREGIS and compatible tracking and registry systems.	
9. Data Volumes and Data Retention	Provide sufficient capacity to support the estimated numbers of WREGIS participants within the Western Interconnection and the related estimated numbers of Accounts, Subaccounts, Certificates, and Interfaces. Provide routine and ad hoc archiving of WREGIS data.	1, 2, 3, 4, 5
10. System Availability, Security, Audit & Backups	Provide system availability and support and ensure the integrity, security, and recovery of the system's data.	All
11. Equipment, Telecommunications and Data Services	Provide the technical infrastructure needed to support WREGIS operations.	6
12. Staffing and Training	Provide the technical and administrative operations and program support staff needed to sustain WREGIS.	6

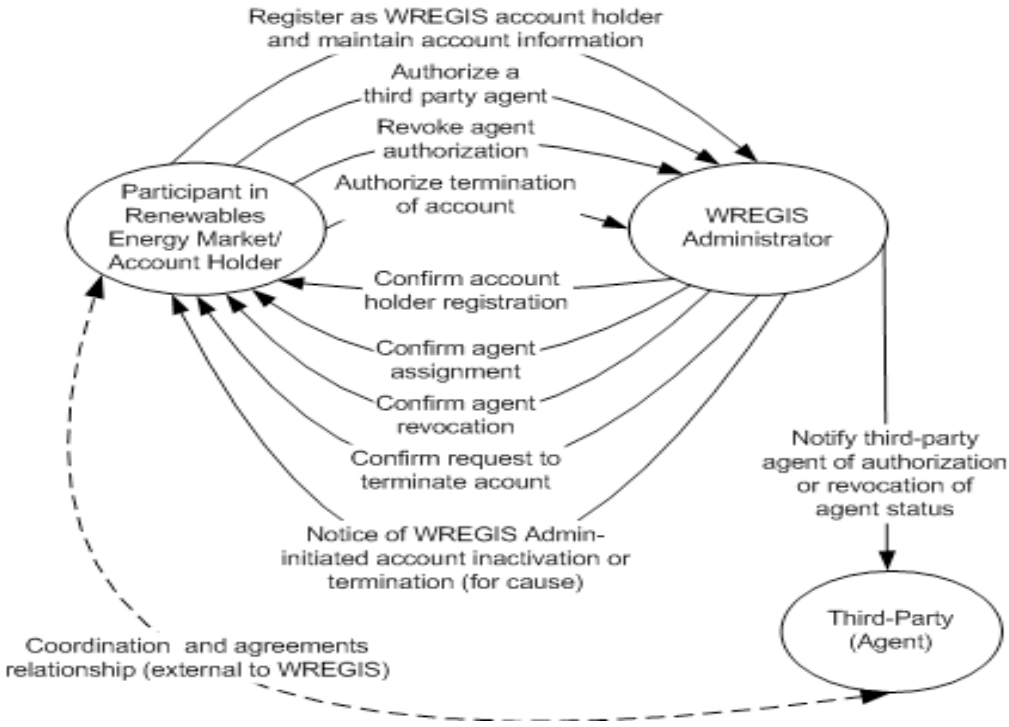
The requirements comprising each category are described in the remainder of this section of the FSR. The principal resource that will provide the WREGIS program and administrative operations support is referred to as the "WREGIS Administrator" within these requirements.

Account Holder Registration and Updates

WREGIS will allow any party to register to become a WREGIS Account Holder in order to participate in the system's Certificate tracking, accounting, transfer, and reporting activities.

Figure 1

Account Holder Registration and Updates



1.0 - Account Holder Registration and Updates	
Requirement Reference	**Requirement Description**
01-001	Allow a party (Registrant) who is confirmed to have paid the required fees to electronically register to become a WREGIS Account Holder.
01-002	Allow the Registrant the option of registering one or more generating units to associate with the WREGIS Account.
01-003	Allow the WREGIS Administrator to establish a WREGIS Account and system access for the Account Holder once the Account Holder Agreement has been verified and to generate an electronic Confirmation of Account Holder Registration notification.
01-004	Allow a party to register for multiple WREGIS Accounts.
01-005	Allow the WREGIS Administrator to designate a third party as an

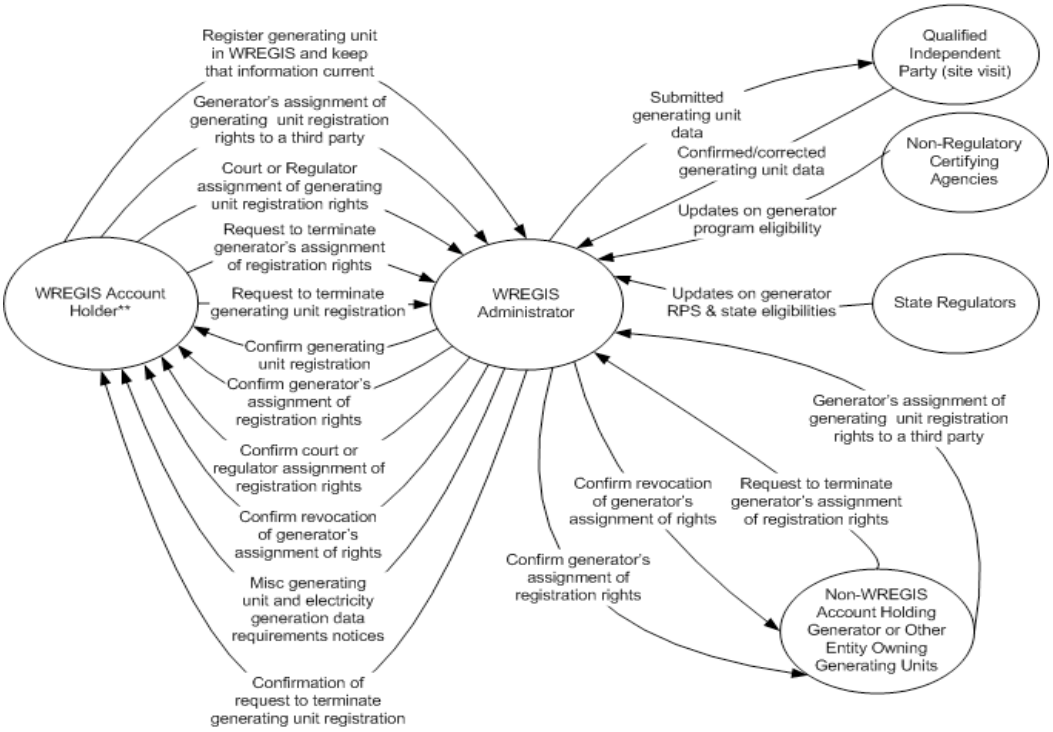
1.0 - Account Holder Registration and Updates	
Requirement Reference	**Requirement Description**
	Agent for the Account associated with specified generating unit(s) when a completed Agent Authorization form is received by assigning the Agent a system log-in and access, generating an electronic Confirmation of Agent Assignment to the Account Holder, and generating an electronic Confirmation of Agent Registration to the Agent that includes the Agent's WREGIS system access information.
01-006	Allow the WREGIS Administrator to revoke the third party as an Agent for an Account when a Revocation of Agent Authorization form is received by disabling the Agent's system login and access, and generating an electronic Confirmation of Agent Revocation to the Account Holder.
01-007	Allow a WREGIS Account Holder to electronically update Account Holder Registration Data for an existing Account.
01-008	Allow the WREGIS Administrator to designate an Account as Inactive and initiate system actions.
01-009	Allow the WREGIS Administrator to terminate an Account when an Account Termination Authorization is received and to send an electronic Confirmation of Request to Terminate Account to the Account Holder.
01-010	Allow the WREGIS Administrator to terminate an Account with cause and send the Account Holder an Account Termination with Cause notification.

Generating Unit Registration and Updates

WREGIS will allow a generating unit to be registered within the system in order to allow the unit's electricity generation to be tracked within WREGIS for the purpose of creating WREGIS certificates.

Figure 2

Generating Unit Registration and Updates



**This entity may be a WREGIS Account Holder that owns and is registering its own generating units OR it may be a WREGIS Account Holder who is registering generating unit(s) owned by someone else (registering as a third party).

2.0 – Generating Unit Registration and Updates	
Requirement Reference	**Requirement Description**
02-001	Allow a Registrant or Account Holder to electronically submit Generating Unit Data (both mandatory and optional data) that includes

2.0 – Generating Unit Registration and Updates	
Requirement Reference	**Requirement Description**
	information on facility characteristics, ownership, regulatory and third party program eligibility,[22] emissions, and other compliance-related data for each generating unit being registered.
02-002	Ensure each unit is uniquely identified by a WREGIS identifier (WREGIS ID) when it is registered by using one of the following mechanisms: • Allow the Registrant or Account Holder to specify a WREGIS ID previously assigned to the generating unit; • Allow the Registrant or Account Holder to specify a previously assigned Energy Information Administration identifier (EIA ID) for the unit and construct the WREGIS ID by prefacing the EIA ID with a "W"; or, • Automatically generate and assign a unique WREGIS ID if neither an existing WREGIS ID nor an existing EIA ID has been specified in the submitted Generating Unit Data.
02-003	Allow a Registrant or Account Holder who is not the owner of the generating unit but who is registering the generating unit on behalf of the unit's owner to electronically submit Third Party Assignment of Registration Rights Data specifying whether the Assignment is based on a Generator's Assignment of Registration Rights or a Court or Regulator Assignment of Registration Rights.
02-004	Allow the WREGIS Administrator to enable the generating unit within WREGIS so that electricity generation reported from that unit is eligible to create WREGIS Certificates by linking the generating unit to the appropriate WREGIS Account once the submitted Generating Unit Data has been confirmed and the Generator's Agreement and Affidavit and all supporting material have been received and confirmed.
02-005	Generate an electronic Confirmation of Generating Unit Registration to the Registrant or Account Holder when the generating unit is enabled within WREGIS.
02-006	Automatically generate an electronic reminder to the Account Holder annually to review and update generating unit data for each generating unit registered for the Account.
02-007	Allow the Account Holder to update the Generating Unit Data for any

[22] Account Holders registering generating units within WREGIS will provide the initial information on such eligibilities; however, the state regulatory agencies and voluntary programs are responsible for keeping the WREGIS Administrator appraised of eligible generators and changes in their status. The generating unit registration process is not completed until the WREGIS Administrator verifies all required data.

2.0 – Generating Unit Registration and Updates	
Requirement Reference	**Requirement Description**
	registered generating unit on an “as needed” basis.
02-008	Prompt the Account Holder to confirm a change to a generating unit’s eligibility for a state, provincial or independent certification when the WREGIS Administrator revises Generating Unit Data based on updates from a state, province or independent certification program.
02-009	When an Account Holder associated with a registered generating unit within WREGIS has failed to remedy an identified WREGIS usage problem or data requirement, allow the WREGIS Administrator to temporarily disable the electricity generation data reported for that generating unit from contributing to creating WREGIS Certificates until the matter is remedied."
02-010	Allow the WREGIS Administrator to terminate registration for a generating unit by scheduling all WREGIS transactions associated with the designated generating unit and the unit’s registration to be terminated 30 days after a Generating Unit Registration Termination Authorization is received and generating an electronic Confirmation of Request to Terminate Generating Unit Registration notification to the WREGIS Account Holder.
02-011	Allow the WREGIS Administrator to revoke a third party assignment of registration rights by terminating the registration of the designated generating unit(s) for the third party Account Holder by scheduling all WREGIS transactions associated with the designated generating unit to terminate and the unit’s registration to be terminated 30 days after a Revocation of Generator’s Assignment of Registration Rights form is received and generating an electronic Confirmation of Revocation of Generator’s Assignment of Registration Rights to the third party Account Holder and the generator.

Establish and Maintain WREGIS Subaccounts

WREGIS will support an Account and subaccount structure that allows Account Holders to manage their WREGIS certificates in a manner consistent with their business and regulatory needs.

3.0 - Establish and Maintain WREGIS Subaccounts	
Requirement Reference	**Requirement Description**
03-001	Allow four different types of subaccounts within each WREGIS Account to record and track information on an Account Holder's WREGIS Certificates at different stages of processing within the system: Active, Retirement, Export, and Reserved.[23]
03-002	Assign a unique Primary Account Number when the WREGIS Administrator establishes a new Account and automatically create one of each of the four different types of subaccounts for the new Account.
03-003	Assign a unique Subaccount Number to each subaccount that is linked to the Primary Account Number of the Account.
03-004	Allow the Account Holder to create additional Active, Retirement, Reserve, and Export subaccounts for an Account.
03-005	Initially link all generating units that have been registered to an Account to the Active Subaccount that is automatically created when the Account is established. (See the Create and Deposit WREGIS Certificates category for associated requirements.)
03-006	When there is more than one Active Subaccount within an Account, allow the Account Holder to associate a specific generating unit or units already registered within WREGIS for the Account with a specific Active Subaccount.
03-007	Allow Account Holders to change which generating units are associated with Active Subaccounts at their discretion.
03-008	Allow the Account Holder the option of electronically specifying an Alias (Subaccount Name) for a subaccount in order to provide the

[23] Active subaccounts are subaccounts into which new Active WREGIS Certificates can be deposited or existing Active WREGIS Certificates can be transferred and from which Active WREGIS Certificates can be transferred to any other subaccount type. Retirement subaccounts are subaccounts into which WREGIS Certificates from an Account Holder's Active subaccount can be transferred once they have been "used" and from which no transfers can occur. Export (to Compatible Tracking and Registry System) subaccounts are subaccounts into which WREGIS Certificates from an Account Holder's Active subaccount(s) can be transferred for export to a compatible tracking and registry system outside of WREGIS and from which no transfers can occur. Reserved subaccounts are subaccounts into which WREGIS Certificates from an Account Holder's Active subaccount can be transferred when the owner of the Certificates wishes to remove them from the WREGIS system without designating them as "used" and from which no transfers can be made.

3.0 - Establish and Maintain WREGIS Subaccounts	
Requirement Reference	**Requirement Description**
	Account Holder a mechanism for distinguishing among multiple subaccounts of the same type within an Account (e.g., a subaccount associated with a specific product or generating unit(s)).
03-009	Allow Account Holders to change Aliases for their subaccounts at their discretion.
03-010	Allow an Account Holder to query, sort, and display WREGIS Certificates in any of their subaccounts by any of the data fields on the Certificate.

Create and Deposit WREGIS Certificates

WREGIS Certificates will be created based on electricity generation data reported for registered generating units and based on imported renewable energy certificate data imported from compatible tracking and registry systems.

Figure 3

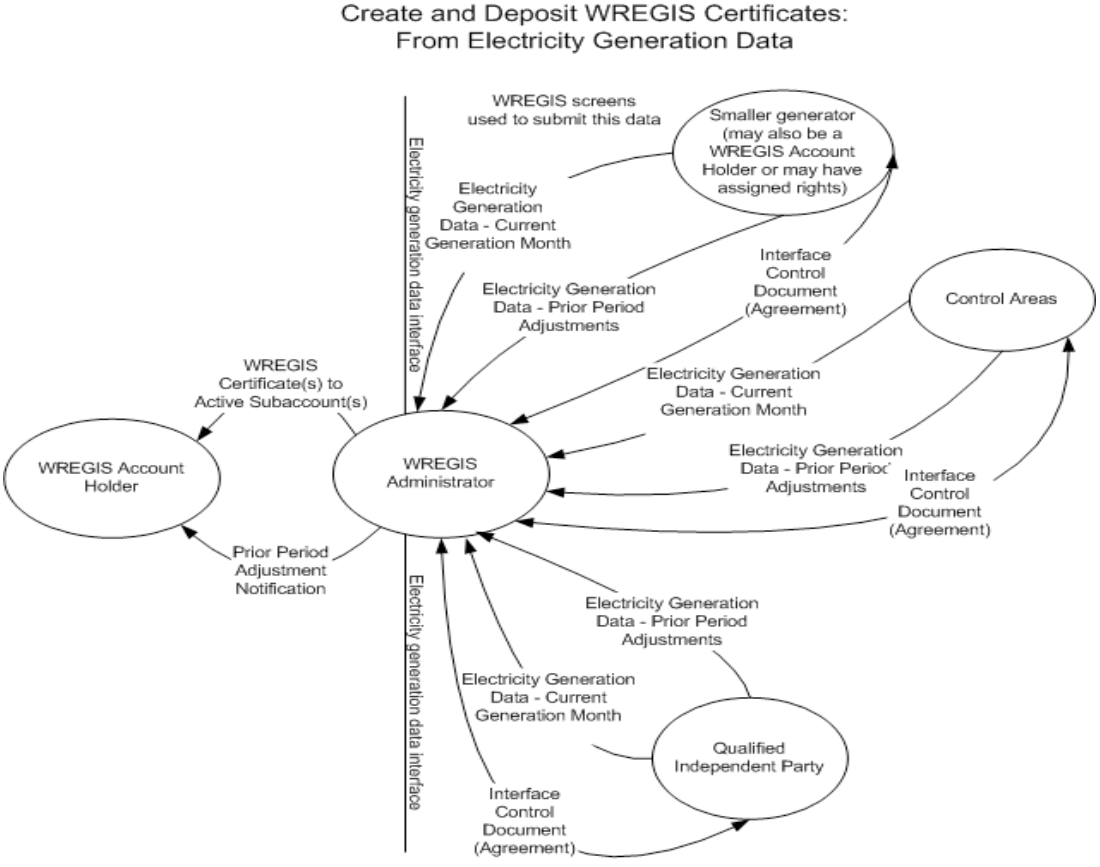
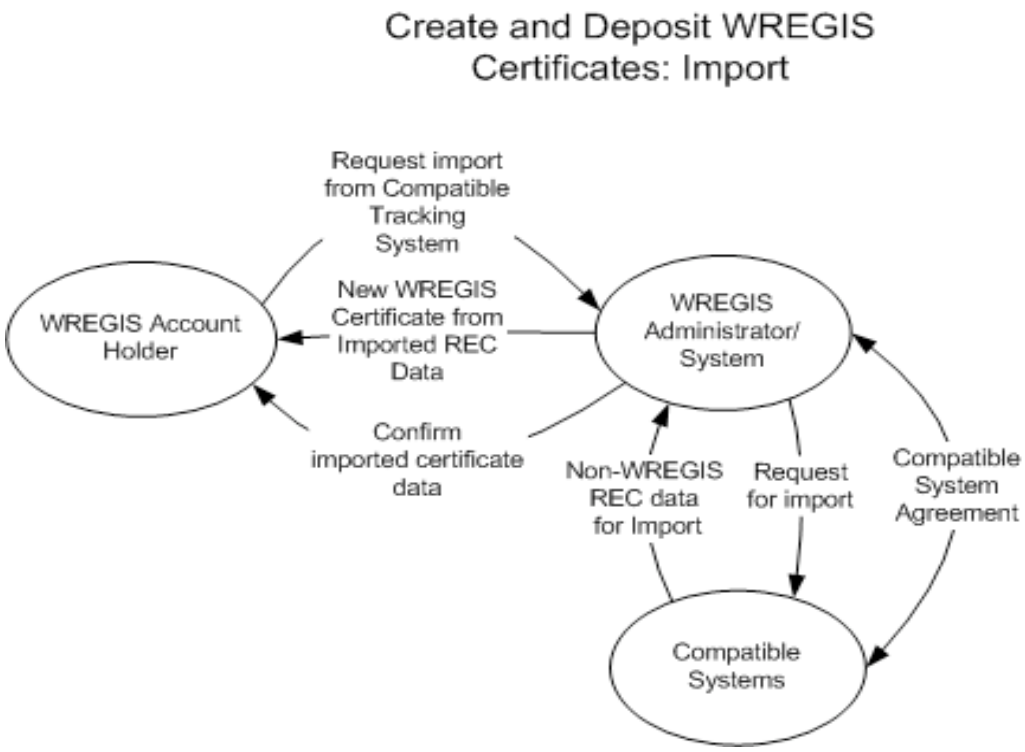


Figure 4



4.0 - Create and Deposit WREGIS Certificates	
Requirement Reference	**Requirement Description**
04-001	Accept electricity generation data from external reporting entities for 75 days after the end of the current Reporting Month.
04-002	Accept electricity generation data from the following types of external reporting entities: • Control Areas[24] with automated methods for collecting generating unit meter data; • Qualified third parties collecting generating unit meter data; and, • Small generators self-reporting electricity generation via the WREGIS Self-Reporting Interface screens.

[24] The following more inclusive definition of a "Control Area" was developed by the working group of stakeholders and industry consultants who developed the proposed interim operating rules (WREGIS Operating Rules Committee) is also used for the purposes of these requirements: "An electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation of the Interconnection … a Control Area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A Control Area operator may be a system operator, a transmission grid operator, or a utility."

4.0 - Create and Deposit WREGIS Certificates	
Requirement Reference	**Requirement Description**
04-003	Allow reporting entities to report electricity generation data during a current Reporting Month that represents one or more months' worth of electricity generation data depending on the type of generating unit and its generation capacity.
04-004	For electricity generation data submitted via the WREGIS Self-Reporting Interface screens, allow the reporting entity to enter the cumulative generation total (as reflected on the meter) and automatically compare this with the last reported cumulative generation total to calculate the actual electricity generated for the month(s) reported.
04-005	Post the MWh credits[25] derived from the reported electricity generation data for the current generation month(s) to the Generation Activity Log associated with each generating unit.
04-006	Allow Account Holders with registered generating units to review and accept or dispute the MWh credits for the current generation month(s) posted to their associated Generation Activity Logs beginning on the first day following the last day of the current Reporting Month through eighty-two (82) days after the last day of the current Reporting Month.
04-007	Generate an electronic Prior Period Account Adjustment Notification to each Account Holder with generating units for which prior generation month MWh credit and debit adjustments are reported. Allow the Account Holder 90 days from the time the prior generation month MWh credits and debits are posted to review these adjustments via the associated Generation Activity Log and accept or dispute the adjustments.
04-008	Allow the WREGIS Administrator to create MWh debit or credit adjustments for the reported electricity generation data to be posted to the next Reporting Month based on the outcome of an Account Holder's Dispute during the current Reporting Month.

[25] The MWh credits and debits may be whole or fractions of MWh.

04-009	Calculate WREGIS Certificates at the rate of one (1) MWh per Certificate ninety (90) days[26] after the last day of the current Reporting Month using the MWh credits and debits in each Generation Activity Log associated with a registered generating unit enabled to issue WREGIS Certificates. [27]
04-010	In the case of the MWh credits and debits in the Generation Activity Log associated with a Multi-fuel registered generating unit enabled to issue WREGIS Certificates, calculate separate WREGIS Certificates to reflect the renewable-based MWh reported and the non-renewable-based MWh reported.
04-011	Assign each WREGIS Certificate a unique WREGIS Certificate serial number and deposit each Certificate into the designated Active Subaccount based on the generating unit associated with the electricity generation or Forward Certificate Transfer obligations.[28]
04-012	Accumulate and maintain any fractional MWh credits remaining in the Generation Activity Log for a registered generating unit after creating the WREGIS Certificates for the current Reporting Month so these credits can be applied towards creating WREGIS Certificates in future Reporting Months.
04-013	Automatically generate an electronic reminder to the Account Holder for any registered generating unit qualified to self-report via the WREGIS Self-Reporting Interface screens that has not reported electricity generation data within the maximum allowable time period.
04-014	Display a list of Compatible Tracking and Registry Systems with which the WREGIS Administrator has established Compatible Tracking and Registry System Exchange Agreements to support exports of WREGIS Certificates and imports of renewable certificate data from other tracking and registry systems.

[26] The Operational Rules Committee (ORC) was one of two working groups of industry participants and regulatory stakeholders who convened under California Energy Commission (CEC) and Western Governors' Association (WGA) sponsorship to propose the self-funding considerations, governance structure, administrative procedures, business rules, and functional requirements that should guide the development and operation of the WREGIS program and information system. The ORC researched the timelines followed by major control areas within WECC in collecting, verifying, and "settling" electricity generation data. Based on that research, the ORC concluded that WREGIS Certificates should be created 90 days following the last day of the reporting month (period) in order to allow sufficient time for the control areas to collect all meter data and report that to WREGIS. This recommendation was based on the California Independent System Operator's (CAISO) timeline, which represents the longest meter data submittal and verification process at the control area level. The deadline within CAISO for final meter submittals is the last day of the trade month + 70 calendar days.

[27] See requirements 02-004 and 02-009 for related requirements.

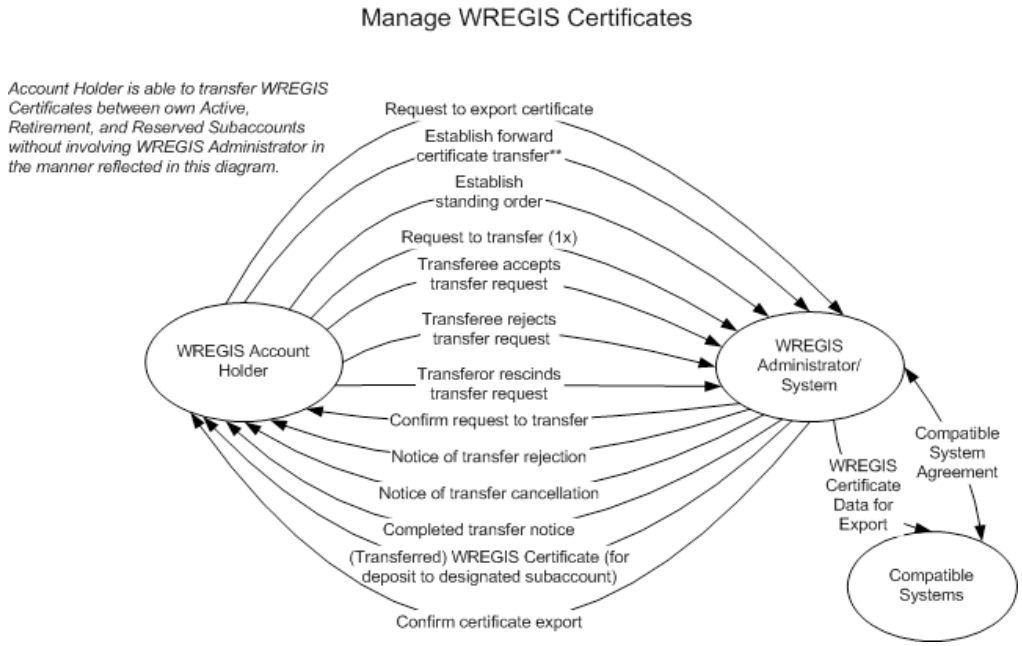
[28] See requirement 05-010 for a related requirement

04-015	Allow an Account Holder to electronically submit a Request for Import of renewable energy certificates from a Compatible Tracking and Registry System and, once the WREGIS Administrator confirms a successful import, use the imported data to create new WREGIS Certificate(s) per the conversion protocols established in the Compatible Tracking and Registry System Agreement.
04-016	Assign each new WREGIS Certificate resulting from an import a serial number that includes a code to reflect that the WREGIS Certificate resulted from an import and a code to reflect the tracking and registry system of origin.
04-017	Deposit the WREGIS Certificate(s) that are created based on an import into the Active Subaccount designated by the Request for Import, and generate an electronic Confirmation of Imported Certificate notification to the Account Holder.

Manage WREGIS Certificates

WREGIS Account Holders will be able to transfer WREGIS certificates between their own subaccounts and to the Active subaccounts of other Account Holders. WREGIS Account Holders will also be able to export WREGIS certificates to other compatible tracking and registry systems.

Figure 5



5.0 - Manage WREGIS Certificates	
Requirement Reference	**Requirement Description**
05-001	Allow an Account Holder to electronically transfer a WREGIS Certificate or a block of WREGIS Certificates from one of the Account Holder's Active Subaccounts to another of the same Account Holder's Active Subaccounts.
05-002	Allow an Account Holder (Transferor) to transfer a WREGIS Certificate or a block of WREGIS Certificates to another WREGIS Account Holder (Transferee) by electronically initiating a Request to Transfer and generating an electronic Confirmation of Request to Transfer notice to the Transferor and the proposed Transferee.
05-003	When a Transferee confirms acceptance of a Request to Transfer, generate a Transferee Acceptance Notification to the Transferor and execute the transfer of the designated WREGIS Certificate(s) from the Transferor's Active Subaccount to the Transferee's Active Subaccount, sending an electronic Completed Transfer Notification to both the

5.0 - Manage WREGIS Certificates	
Requirement Reference	**Requirement Description**
	Transferor and the Transferee.
05-004	Delete a Request to Transfer if the Transferee does not confirm it within fourteen (14) calendar days of when it is requested and notify Transferor and Transferee of the deletion.
05-005	Allow the Transferor to electronically cancel (withdraw) a Request to Transfer any time prior to receiving a Transferee Acceptance Notification by submitting a Request to Cancel Transfer and generate an electronic Cancellation of Request to Transfer Notification to the Transferee when this occurs.
05-006	Allow an Account Holder to electronically request recurring, automatic transfers of WREGIS Certificates from an Active Subaccount to any of the Account Holder's other subaccounts or to the Active Subaccounts of other WREGIS Account Holders via establishing a Standing Order Transfer.
05-007	Follow the same processing requirements and generate the same confirmation and cancellation notifications for Standing Order Transfers as those described for non-recurring Requests for Transfer (requirements #05-002 and #05-003 immediately above) *except* allow the Transferor to electronically cancel (withdraw) the Request to Transfer only if: the Standing Order designates the Transferor may Rescind the order, the electronic Transferee Acceptance Notification has not been sent, and it is at least seven (7) days before the date the transfer is scheduled to occur.
05-008	On a monthly basis and after new WREGIS Certificates have been created and deposited for the Current Reporting Month, transfer the WREGIS Certificates from the designated Active Subaccount per the Standing Order Transfer instructions.
05-009	Allow an Account Holder (Transferor) to electronically establish a Forward Certificate Transfer via which WREGIS Certificates that will be created in a future Reporting Month are scheduled for automatic, direct deposit into the Transferor's other subaccounts or to the Active Subaccounts of other WREGIS Account Holders (Transferees).
05-010	Follow the same processing requirements and generate the same confirmation and cancellation notifications for Forward Certificate Transfers as those described for non reoccurring Requests for Transfer (requirements #05-002 and #05-003 immediately above) *except* allow the Transferor to electronically cancel (withdraw) the Request to Transfer only if: the Forward Certificate Transfer designates the Transferor can Rescind the order, the electronic Transferee Acceptance Notification has not been sent, and it is at least seven (7) days before

5.0 - Manage WREGIS Certificates	
Requirement Reference	**Requirement Description**
	the date the WREGIS Certificates are scheduled to be created.
05-011	Disallow any WREGIS Account Holder from using any of the WREGIS Certificates that are "obligated" in a Forward Certificate Transfer Requests in other Forward Certificate Transfer Requests prior to the date the WREGIS Certificates are actually created and deposited into the appropriate Transferee Active Subaccount.
05-012	On a monthly basis and as new WREGIS Certificates are created for the current Reporting Month, deposit the WREGIS Certificates associated with the Transferor's designated generating unit(s) directly to the appropriate Transferee's subaccount(s) per the Forward Certificate Transfer instructions.
05-013	Allow an Account Holder to electronically submit a Request for Export to a Compatible Tracking and Registry System and, once the WREGIS Administrator confirms a successful export, transfer the designated WREGIS Certificates to the Account Holder's Export Subaccount and generate an electronic Completed Export Notification to the Account Holder.
05-014	Allow an Account Holder to electronically request a transfer of WREGIS Certificates from an Account Holder's Active Subaccount to an Account Holder's Retirement Subaccount to designate the Certificate as "used" and no longer eligible for certificate-based transactions either inside or outside the WREGIS system.[29]
05-015	Allow an Account Holder to electronically request a transfer of WREGIS Certificates from an Account Holder's Active Subaccount to an Account Holder's Reserve Subaccount to designate the Certificate as no longer eligible for certificate-based transactions within the WREGIS system but not "used."[30]
05-016	Allow an Account Holder the option of specifying the "reason" for retiring or reserving a WREGIS Certificate and, when a "reason" is specified in the designated field, disallow subsequent changes to that field once the Certificate is reserved or retired.

[29] Although there are specific instances in which it is envisioned an Account Holder will retire a WREGIS Certificate, an Account Holder can designate a WREGIS Certificate as "used" for any reason.

[30] Although there are specific instances in which it is envisioned an Account Holder will reserve a WREGIS Certificate, an Account Holder can designate a WREGIS Certificate as "reserved" for any reason.

Access Assignments and Updates

The information system and the WREGIS program and administrative staff operating the system will establish system access rights.

6.0 – Access Assignment and Updates	
Requirement Reference	**Requirement Description**
06-001	Allow the WREGIS Administrator to establish WREGIS system access for a new Account Holder by generating a unique login and default password that, in conjunction, gives the Account Holder Full Account Management permissions. Full Account Management permissions include the ability to perform the following activities with respect to a WREGIS Account or its associated registered generating units: revise Account Holder Registration Data; revise and confirm externally-initiated changes to Generating Unit Registration Data; enter electricity generation data via the Self-Reporting Interface screens (as applicable); designate or revoke a third party Agent; terminate an Account; terminate the registration of a generating unit associated with the Account; create new Active, Retirement, Reserve, and Export Subaccounts; assign and revise subaccount aliases; create custom WREGIS private Account Holder reports; run any Account Holder private report (standard or custom); and perform all WREGIS Certificate transactions (see the Manage WREGIS Certificates category for a full description of these transactions).
06-002	Allow the Account Holder to change the default password that is assigned when a new Account is first established, to change a password whenever desired, and to send a Forgotten Password Notice to the WREGIS Administrator when the Account Holder has forgotten his/her password. Allow the WREGIS Administrator to generate a new default password in response to a Forgotten Password Notice and generate a New Password Notification to the Account Holder with the new password information.
06-003	Allow the WREGIS Administrator to establish WREGIS system access for an Agent designated by the Account Holder by generating a unique log-in and default password that, in conjunction, gives the Agent Full Account Management permissions.[31]
06-004	Allow an Account Holder to establish WREGIS system access for other individuals in the Account Holder's organization by electronically specifying the names and contact information for each individual and generating a uniquely assigned log-in and default

[31] This is the mechanism that will be used to allow an Account Holder to grant access to any third party, including a state regulator.

6.0 – Access Assignment and Updates	
Requirement Reference	**Requirement Description**
	password granting selected Account Management permissions for the Account for each individual. Allow the Account Holder to modify or revoke established WREGIS access for other individuals within the Account Holder's organization as needed (e.g., change in position duties; staff turnover).
06-005	Allow the WREGIS Administrator to have complete WREGIS system administration permissions, including Full Account Management permissions for all WREGIS Accounts, in order to perform required WREGIS Administrator activities. Allow the WREGIS Administrator to establish WREGIS access with designated WREGIS system administration permissions, including designated Account Management permissions for WREGIS Accounts, for other authorized WREGIS administrative operations staff by electronically specifying the names and contact information for each staff person and generating a uniquely assigned log-in and default password.
06-006	Allow an Account Holder to access WREGIS using assigned system log-in and password via a secure web portal interface. Allow any interested entity to access the WREGIS public reports via a public WREGIS website with no log-in or password requirements.

Report on WREGIS Data and Related Features

WREGIS will support public and private reporting and message boards as well as authorized inquiries on the status of specific WREGIS Certificates.

7.0 – Report on WREGIS Data and Related Features	
Requirement Reference	**Requirement Description**
07-001	Provide a public website via which a requestor can specify sorting and other report customization options to obtain reports on WREGIS Account Holders and WREGIS Registered Generating Units (based on non-confidential elements of the WREGIS Account Holder Registration Data and Generating Unit Data).
07-002	Provide a public website via which a requestor can run summary level reports on WREGIS Certificate activity by choosing from among four standard public report types and specifying the date range and the sort sequence of the data fields on the report. Each standard public report includes generating unit data and information on the associated energy generation without identifying the specific generating units or corresponding WREGIS Accounts. The four standard report types include:

7.0 – Report on WREGIS Data and Related Features	
Requirement Reference	**Requirement Description**
	• Certificates Created; • Certificates Transferred; • Certificates Retired; and, • Certificates Reserved or Imported or Exported to a Compatible Tracking.
07-003	Display a list of all WREGIS agreement, authorization and notification forms and allow a requestor to select and download an electronic copy of any form listed.
07-004	Disallow a public report request for summary level WREGIS Certificate activity when the options specified would so narrow the reporting results that a WREGIS Account Holder's confidential data would be inadvertently revealed. Disallow this type of public report when such a request would result in reporting activity for so few generating units that the identities of specific units could be derived from the results.
07-005	Allow an authorized requestor to enter a WREGIS serial number or range of serial numbers on the public website and display the following information on the indicated WREGIS Certificate(s): • Certificate Status (Active, Retired, Reserved, or Exported) • Certificate data fields • Date Retired, Reserved or Exported (if applicable).
07-006	Allow the Account Holder to run standard private Account Holder reports via a secure, password-protected WREGIS website by specifying the date range for the report and the sort sequence of the report's data elements and choosing from among standard private Account Holder report types. The standard types of private Account Holder reports include reports on: • WREGIS Certificates (held, deposited, imported, exported and retired); • Reported electricity generation; • Account transactions (including corrections); • Account changes and other events; and, • Generation Activity Log.
07-007	Allow the Account Holder to display the detail data underlying each report line on any of the standard Account Holder private reports.
07-008	Provide the Account Holder an ability to create custom reports via selecting the date range and the subaccount(s) for which the report will be generated and specifying the type of transactions and the data fields to be included on the report.

7.0 – Report on WREGIS Data and Related Features	
Requirement Reference	**Requirement Description**
07-009	Allow the Account Holder to submit a Request to Submit Report to Third Party transaction by allowing the Account Holder to electronically: designate the standard or customized private Account Holder report to be run and distributed; specify the contact information and email address of the third party to whom the report should be emailed; and, preview the designated report.
07-010	Confirm a Request to Submit Report to Third Party by prompting the Account Holder to confirm the request while displaying the report output as well as the email address and contact information for the designated third party. Once confirmed, submit the report output via email to the designated Third Party.
07-011	Allow the WREGIS Administrator the ability to host message boards for Account Holders as well as message boards for the public.

WREGIS Data Interfaces

WREGIS will support data interfaces with reporting entities providing electricity generation data and compatible tracking and registry systems for the import and export of renewable energy certificate data.

8.0 – WREGIS Data Interfaces[32]	
Requirement Reference	**Requirement Description**
08-001	Accept and process electricity generating data from reporting entities in accordance with the specifications established in each Interface Control Document.
08-002	Accept and process import of renewable energy certificate data from Compatible Tracking and Registry Systems in accordance with the appropriate Compatible Tracking and Registry System Exchange Agreement.
08-003	Export WREGIS Certificates to Compatible tracking and registry systems in accordance with the appropriate Compatible Tracking and Registry System Exchange Agreement.

[32] All requirements in this category are met via the combined and coordinated efforts of the system developer and technical operations vendor and the WREGIS Administrator.

Data Volumes and Data Retention

WREGIS will be designed and implemented to support the numbers of users and data volumes anticipated for the Western Interconnection participants.

9.0 – Data Volumes and Data Retention	
Requirement Reference	**Requirement Description**
09-001	Be able to support up to 2000 individual WREGIS Accounts and up to 1.2 million individual subaccounts.
09-002	Be able to support data interfaces with up to 450 reporting entities.
09-003	Be able to support imports and exports with up to nine (9) Compatible Tracking and Registry Systems.
09-004	Be able to create up to 5 million WREGIS Certificates a month and support up to 200 million WREGIS Certificates residing within the WREGIS information system at any point in time (exclusive of certificates that have been archived).
09-005	Have sufficient architectural flexibility to allow potential expansion to support ability to: • Add up to 50 additional data fields to be included in Generating Unit Data and to be reflected on WREGIS Certificates; and, • Receive and create WREGIS Certificates based on electricity generation data for electricity with attributes other than renewable, potentially upwards to receiving electricity generation data for all electricity generation in the Western Interconnection.
09-006	Allow the Account Holder to request an archive of WREGIS Account data on an ad hoc basis by specifying the date before which the data detail should be removed from WREGIS and archived outside the system.
09-007	Allow the Account Holder to request that previously archived WREGIS Account data be restored to the system.
09-008	Allow the technical operations staff to perform routine, system-wide archive of WREGIS Account data.
09-009	Based on WREGIS Administrator request or in response to system problems, allow the technical operations staff to restore some or all of WREGIS Account data previously archived as part of the routinely scheduled system-wide archive.

System Availability, Security, Audit and Backups

A three-tier approach will be used to ensure that only authenticated users can access WREGIS Account data. The first tier is to establish WREGIS-specific access and permissions (application-specific access). The second tier is to allow WREGIS end-user access only through a secure web portal using digital certificates. A third and final tier is to require that all data interfaces to WREGIS incorporate secure file transfer protocols using encrypted communications.

10.0 – System Availability, Security, Audit and Backups	
Requirement Reference	**Requirement Description**
10-001	Allow Account Holder access for all Account Management activities during any time of the day, seven days a week except for those times during which scheduled system transactions or unexpected system problems disallow Account Holder access (e.g., back-ups; routine maintenance).
10-002	Allow only authenticated users to access WREGIS Account data, where authentication is controlled via WREGIS log-ins and password assignments in conjunction with digital certificates implemented in a secured web portal providing access to WREGIS.
10-003	Allow data interfaces to the system via secured file transfer protocols using encrypted communications only.
10-004	Provide an electronic audit trail of all WREGIS Account modifications. This audit trail will record the date and time of the change, a record of the change itself, and the designation of the party making the change.
10-005	Allow ad hoc backup of WREGIS data as requested by the WREGIS Administrator and allow WREGIS data that has previously been backed up to be restored to WREGIS when requested by the WREGIS Administrator.
10-006	Establish well-defined, tested, and documented routine backup and recovery processes. Ensure system backup and operational recovery plans and processing are consistent with California State Administrative Manual section 4843.1 Agency Operational Recovery Plan (revised 6/03) and State Information Management Manual Section 140 Operational Recovery Plan Topic Outline.
10-007	Functionality related to digital certificates and/or digital signature functionality will comply with the California Digital Signature Regulations (as posted at the California Secretary of State's website, www.ss.ca.gov/digsig/regulations.htm).

Equipment, Telecommunication and Data Services

The equipment, telecommunication and data services required to support WREGIS' technical operations and the program and administrative operations will be sufficient to address WREGIS processing.

11.0 – Equipment, Telecommunication and Data Services	
Requirement Reference	**Requirement Description**
11-001	Provide equipment, telecommunications and data services of the capacity and in the numbers required to support the WREGIS web-based information system.[33]
11-002	Establish a work environment for the WREGIS program and administrative operations staff. The work environment will include office furniture, telephones, workstations with standard desktop application software, internet access, and other office equipment (e.g., copiers, fax). (See the Staff and Training category for more information on administrative operations.)

Staffing and Training

The system development and technical operations vendor will maintain and provide technical operations of the system once implemented at a vendor-provided data center. The WREGIS staff at WECC will provide program and administrative operations support at the WECC primary office in Salt Lake City, Utah.

12.0 – Staff and Training	
Requirement Reference	**Requirement Description**
12-001	The WREGIS program and administrative operations staff (WREGIS Administrator) will provide the following program and administrative operational support for WREGIS: a. Verify generating unit data as part of initial generating unit registration and whenever the Account Holder updates generating unit data. Receive and process eligibility information for registered generators from state, provincial and voluntary programs. b. Confirm receipt, accuracy and completeness of agreements and other types of hardcopy and electronic requests and supporting materials submitted in order to establish or maintain a WREGIS Account.

[33] The specific characteristics of the equipment, telecommunications, and data services required for WREGIS technical operations will be identified at the time of contracting with the vendor to develop and operate the WREGIS, web-based information system.

12.0 – Staff and Training	
Requirement Reference	**Requirement Description**
	c. Generate electronic notifications in response to submitted agreements, requests, or WREGIS Account issues. d. Assign and revoke WREGIS system access. e. Working with reporting entities, establish Interface Control Documents for supplying electricity generation data to WREGIS. Base all Interface Control Documents on a common template designed to specify a common approach and set of standards for data communications with WREGIS and include the specific details concerning the data exchange between WREGIS and each individual reporting entity as appendices. [34] f. Establish Compatible Tracking and Registry System Exchange Agreements that: • Ensure that any renewable energy certificates that are candidates for import to WREGIS from other tracking and registry systems meet the renewable definition of at least one of the western states or provinces included in the Western Interconnection and directly serviced by WREGIS. • Incorporate any state or provincial regulatory restrictions associated with import or export of renewable energy certificates. • Explicitly state the provisions that will be taken to avoid double counting between the two systems. • Specify the minimum standards necessary to ensure the security and integrity of the renewable energy certificate information and accuracy of conversion while supporting the maximum compatibility between WREGIS and existing and emerging tracking and registry systems.[28]

[34] This requirement is met via the combined and coordinated efforts of the WREGIS Administrator and the system developer and technical operations vendor.

12.0 – Staff and Training	
Requirement Reference	**Requirement Description**
	• Defining conversion specifications and data exchange protocols.[28] g. Post MWh adjustments or reverse transactions performed on specific WREGIS Accounts based on the outcome of an Account Holder dispute, audits, or special requests. h. Establish ad hoc back-up and recovery procedures. i. Define, establish and maintain message boards for WREGIS Account Holders as well as the public to facilitate Account Holders and interested others sharing information about WREGIS Certificates. Post communications about the WREGIS program, the system operations, and other topics of interest to the WREGIS Account Holders on either these messages boards or elsewhere on the WREGIS system.[28] j. Develop and support a process for: evaluating voluntary programs that will be considered for verification and reporting via WREGIS; identifying the data fields needed to support such programs; and, communicating to WREGIS participants and others when a voluntary program is included within the scope of WREGIS. k. Develop and apply a dispute resolution process for transactions related to a WREGIS Account. l. Issue advisory rulings for multi-fuel generators not meeting current WREGIS requirements and other generator or Account Holder issues as they arise. m. Perform periodic audit of WREGIS Account and generating unit data, taking action when audit outcome determines Account Holder-supplied data is not accurate or complete. n. Develop and apply an Inactive Account process. o. Develop and apply a process for system and administrative steps taken when any WREGIS Account Holder or registered generating unit has engaged in fraudulent acts or acts prohibited in the WREGIS Account Holder agreement. p. Respond to all WREGIS program inquiries and provide first-line support for all WREGIS information system usage questions or problems. q. Develop training materials and provide training for new WREGIS participants and for continuing participants when future WREGIS modifications and enhancements warrant. r. Manage the service request process for defining, prioritizing, and staging WREGIS modification and enhancement requests once the system is operational.

12.0 – Staff and Training	
Requirement Reference	**Requirement Description**
	s. Develop and deploy WREGIS educational, marketing and outreach campaign.
12-002	The vendor providing the technical infrastructure and staff for WREGIS technical operations will: a. Provide, maintain and operate the telecommunications, hardware, system and application software, and technical staffing required to operate WREGIS. b. Provide the CPU, bandwidth, data storage and hardware capacity and technical staff in the numbers and with the skills to meet the general requirements specified in the Data Interfaces, Data Volumes and Data Retention, and the System Availability, Security, Audit & Backups categories described earlier in this section. c. Schedule and communicate in advance any anticipated system "down time" required for system maintenance. d. Provide second-line support for all WREGIS information system usage questions or problems. e. Monitor system performance. f. Provide all services and support consistent with established service level agreements.

4. Baseline Analysis

4.1 Current Method

Manual systems for verifying RPS compliance are not feasible. As noted, SB 1078 helps compensate developers for the benefit externality by requiring that a specific amount of electricity used in California be generated using eligible renewable energy sources. With implementation of the RPS, SB 1078 also directs the Energy Commission to design and implement an accounting system (tracking and registry system) to assure RPS compliance. As was described in the Business Problem or Opportunity section, et seq., manual methods to assure RPS compliance are simply not feasible given the volume of electricity sales and participants in the electricity market. Additionally, manual systems do not establish property rights to the RECs (for example, if two retailers claimed purchases from the same generator and the claims exceeded production from that generator).

5. Proposed Solution

5.1 Proposed Solution and Rationale

The proposed WREGIS solution includes two components:

1. Acquire an information system to meet WREGIS requirements and provide the technical infrastructure[35] and staff to operate that system. The proposed solution recommends purchasing the rights to an existing renewable energy generation tracking and registry system (or a similar environmental certificate-tracking system) and contracting with a vendor to modify it to meet the WREGIS information system requirements and to provide the technical infrastructure and technical staff to operate the system once operational.
2. Establish an institutional home to operate as the legal host of the WREGIS program and provide staff to develop and administer the program. The proposed solution recommends utilizing WECC as the institutional home for the WREGIS program and hiring two full-time WREGIS staff to operate at WECC to develop and administer the WREGIS program and to perform administrative operation of the WREGIS information system.

5.1.1 Rationale for the Information System Development and Operations Solution

As discussed in Sections 3.2 and 5.3 of this document, retaining or even partially automating the Energy Commission's current manual method for tracking RPS compliance would not fully meet the legislative mandates of SB 1078. An integrated information system designed to track and register renewable energy generation is required to fully meet legislative mandates and address business objectives. Leveraging the functionality available in an existing tracking and registry system with a proven track record provides a greater likelihood of reduced cost, less risk and a shorter development schedule than developing a new system.

There are currently two renewable energy generation tracking and registry systems operational in the United States,[36] and additional systems operating in Europe and Australia. In addition, there are several other types of environmental certificate-tracking systems operational within the United States and abroad. Although these other types of

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[35] Providing the "technical infrastructure" refers to the vendor providing the facility, hardware, telecommunication, and other materials needed to provide the operating environment to run and support the WREGIS information system.

[36] Wisconsin has also developed an accounting and verification system for that state's RPS compliance; however, that system reportedly creates renewable energy certificates upon retail sale (vs. reported electricity generation), has a more limited scope of function than envisioned for a fuller renewable energy generation tracking and registry system, and serves only a single state. For the purposes of this document it is not considered an existing renewable energy generation tracking and registry system but rather as a similar, related system.

environmental tracking systems offer a less complete alignment with the WREGIS requirements than do the renewable energy generation tracking and registry systems, they do include similar functionality. The functionality provided by these systems varies with the complexity and size of the region in which they are operating. However, one or more of the systems could serve as a comprehensive base upon which to build WREGIS functionality.

Outsourcing the system development and technical operations of WREGIS to a vendor with the existing expertise and resources supports a shorter duration development cycle and allows the Energy Commission and WECC to fill WREGIS roles consistent with their respective missions and capacities. Outsourcing WREGIS' system development and maintenance relieves the Energy Commission's Information Technology Services Branch (ITSB) of the need to staff up to undertake a large information technology work effort, an activity that would be inconsistent with the organization's strategic plan and its existing structure. Outsourcing technical operations eliminates the need for WECC and the WREGIS program to develop data center capacity to support WREGIS, allowing the organization to focus instead on developing and administering the program (and information system) throughout the Western Interconnection.

Theoretically, the system development and technical operations elements of the WREGIS solution could be procured separately and contracted to two separate vendors. However, the outcome of the market survey suggests it is unlikely a vendor would bid on the technical operations alone. This fact, in tandem with the timing complexities introduced by two separate RFPs and the overhead and risk of coordinating maintenance and operations across two separate vendors once WREGIS is operational, recommends a procurement approach in which the WREGIS information system development and its subsequent technical operations are provided by a single vendor. This vendor is referred to as the *system development and technical operations vendor* for the remainder of this document.

Advantages

- Meets the legislative mandate of SB 1078.
- Increased end-user and regulatory-user satisfaction due to the potential for significant alignment of the system with WREGIS' business objectives and functional requirements.
- Lower development risk, since it begins with a proven system.
- Reduced risk of delayed delivery and increased possibility of shortest duration project, since the base system already includes some established functionality required for WREGIS.
- Assuming minimal modifications are needed to the base system in order to address WREGIS requirements, this alternative has the potential to be less costly than building a new system or modifying a commercial, off-the-shelf (COTS) product.

- Several existing generation tracking and registry systems and other types of environmental certificate-tracking systems provide functionality consistent with elements of WREGIS' functional requirements.
- Utilizing a single system development and technical operations vendor provides the following advantages: requires less administrative resources to administer; facilitates a shorter development and implementation schedule; reduces operational risk; supports more timely resolution of system problems; and, permits more system maintenance and modification flexibility.

Disadvantages

- There are fewer vendors with specific expertise developing and maintaining renewable energy generation tracking registry systems than there are vendors with experience developing and maintaining more general purpose software systems.
- The Energy Commission does not have significant experience in providing technical oversight for customizing a base system to produce a system the size and complexity of WREGIS.[37]
- Development risk due to uncertainty about the ease and efficiency with which the base system can be extended to meet the additional flexibility and complexity of WREGIS.
- Since the system would be built on a modified architecture that might not have been designed to allow for the flexibility WREGIS specifies, it could be more difficult to maintain and extend the WREGIS information system over time.

5.1.2 Rationale for the Institutional Home and Program Administration Solution

Designating WECC as the institutional host affiliates the WREGIS program with an established, policy-neutral organization that provides a forum for coordinating, communicating and collaborating among stakeholders to ensure electric system reliability, establish standards, and support efficient competitive power markets within the Western Interconnection. The following WECC characteristics will contribute to the successful operation of WREGIS:

- WECC and the organizations from which it was formed have nearly 50 years experience working with the diversity of interests represented in the stakeholders from the many states and provinces comprising the Western Interconnection.
- WECC has established contracts and agreements with many of the same market place members anticipated to participate in WREGIS, providing models for similar

[37] The Energy Commission's ITSB focuses on information technology infrastructure, performance, security, and reliability—not system development.

WREGIS agreements and, in some instances, agreements that could be extended to include WREGIS (e.g., confidentiality agreements).

- WECC has experience hosting a data system to meet some of the needs of its stakeholder community.

A WREGIS Governance Committee will be created as a WECC board committee to perform the executive administration of the WREGIS program and its policies. The WREGIS Governance Committee will be responsible for the approval of budgetary concerns, enforcing policies, and approving functionality, security, and scope decisions regarding WREGIS once WREGIS is operational. This committee will include representatives from the Energy Commission, WECC, WGA, and other stakeholders.

Constituting the WREGIS program as a WECC board-level committee provides the program flexibility in terms of its specific procedures and composition while at the same time providing an established and recognized framework for conducting business. One of the three WREGIS stakeholder working committees created in January 2004, the WREGIS Institutional Committee, is working with WREGIS stakeholders and sponsors to define the specific initial composition and function of the WREGIS Governance Committee as well as the role and structure of a WREGIS Advisory Committee that will provide the WREGIS Governance Committee policy and technical advice on issues. Structuring the WREGIS program's governance in this manner will better ensure that decisions and directions established by the WREGIS Governance Committee are credible, fair, and consistent with the public's interests and responsive to the needs of the WREGIS account holders and other stakeholders in the system.

Establishing WREGIS as an independent program operating within the WECC institutional home maintains a balance of integration and independence between WECC's mission and that of the WREGIS program. Staffing two full-time WREGIS program positions at WECC supports the program outreach and development activities critical to attracting and servicing the renewable energy certificate needs of the wider participant base needed to track all renewable energy within the Western Interconnection at the lowest possible costs. Assigning the administrative operations of the WREGIS information system to these dedicated program staff, as opposed to a contracted vendor, better allows these important tasks to be performed by those most familiar and focused on the WREGIS program and the successful achievement of its goals.

Advantages

- Encourages WECC-wide participation because the program and information system are more likely to be perceived as "policy neutral" and not necessarily aligned with one particular state's interest. Greater participation would reduce the participant usage fees, meeting the objective of providing the WREGIS system at the lowest possible cost.
- WREGIS is seen as the most cost-effective way to meet RPS compliance by WECC participants, which would not necessarily be the case if WREGIS were hosted by a particular state or established as a new organization.

- WECC is the only organization in the western region with the stature, capability, and credibility to host a program such as WREGIS.
- This alternative does not add new responsibilities for the Energy Commission staff, who are already over allocated.

Disadvantages

- Although this alternative provides for hiring staff with the experience needed to perform the WREGIS program and administrative operations functions, WECC has had limited experience performing these types of functions for a system of the size and complexity of WREGIS. This lack of organizational experience poses some operational risk.

5.2 Proposed Solution Description

The proposed WREGIS information system solution meets the business requirements by purchasing an existing, web-based renewable energy generation tracking and registry (or similar) system as the base and contracting with a development vendor to modify it to meet the WREGIS requirements and to provide the technical infrastructure and services to operate it.

The proposed solution for the WREGIS institutional home and program administration will be met by dedicated WREGIS staff operating at WECC, an existing regional non-profit organization that already services many of the same market place participants that are, or will be, WREGIS stakeholders.

5.2.1 Hardware

The system development and technical operations vendor will provide the hardware environment required for operating the proposed WREGIS information system solution.

The WREGIS program and administrative operations staff who will operate at WECC will acquire workstations, printers, telephones, furniture and other work environment hardware that are compatible with WECC's technical and physical environment.[38]

5.2.2 Software

The system development and technical operations vendor will provide the WREGIS information system software. Any platform software required to support the WREGIS information system solution (e.g., third-party operating system and database software) will be determined at time of contract.

The system development and technical operations vendor will also provide the software needed to provide the technical infrastructure for operating the WREGIS information

[38] This equipment is intended to support the two full-time, dedicated staff estimated to support WREGIS program and administrative operations at WECC.

system solution (any software needed in addition to the WREGIS information system and platform software).

The WREGIS program and administrative operations staff who will operate at WECC will acquire desktop application software and software needed for Internet and network connectivity compatible with WECC's software and network environment.

5.2.3 Technical Platform

The proposed WREGIS information system solution will operate as a web-based solution accessible by account holders, the WREGIS program and administrative operations staff, and other interested parties via a standard Internet browser. The details of the technical operating environment for the information system will be established at the time of contract with the system development and technical operations vendor.

The WREGIS program and administrative operations staff that will operate at WECC will acquire and deploy workstation equipment and software consistent with the technical platform established at WECC.

5.2.4 Development Approach

The system development and technical operations vendor will perform all development activities; neither state nor WECC staff will perform any development activities.

The approach used by system development and technical operations vendor will use IEEE or comparable software development best practices in modifying the base system to meet the WREGIS requirements. System and program specifications for the base system will be updated to reflect the modifications in order to ensure that a complete and comprehensive set of WREGIS system specifications are developed, documented, delivered and available when the system is deployed.

5.2.5 Integration Issues

There are no systems with which the proposed WREGIS information system solution must interoperate.

5.2.6 Procurement Approach

The WREGIS FSR team performed a market survey to identify cost, resource, and duration estimates for providing any or all of the following vendor services initially envisioned as possible component approaches to meeting the WREGIS requirements:

1. Develop and implement the system per requirements;
2. Operate the system per requirements once implemented; and,

3. Provide an Application Service Provider (ASP) service that meets the software application and technical operations requirements.[39]

Of the 15 vendors that were sent the market survey, five responded. In addition to providing cost, duration, and resource estimates, the market survey results suggested that the potential vendor base for providing the WREGIS development and operations solution is reasonably sized and represents a diversity of base products and industry experience.

The proposed WREGIS information solution deliberately does not prescribe a specific hardware, software or technical platform (other than being web-based) and instead seeks vendors to propose these system specifications in their solutions. The WREGIS sponsors and stakeholder also desire the ability to evaluate vendors based on factors in addition to cost (e.g., industry experience, experience operating similar system, end-user satisfaction with base system, etc.). Finally, the estimated costs of contracting to develop and operate the information system will exceed the Energy Commission's delegation level and the limits allowed for funding work efforts via the California Multiple Award Schedules (CMAS). In light of these considerations, a competitive-procurement approach utilizing a request for proposal (RFP) will be used to secure the system development and technical operations vendor.[40]

5.2.7 Technical Interfaces

The WREGIS information system will support two routine types of interfaces:

- Interface with control areas and other third party reporting entities submitting renewable electricity generation data (which will serve as the source of WREGIS certificates); and,
- Interface with other compatible tracking and registry systems for the import and export of renewable energy certificate data.

Both types of technical interface will rely on WREGIS program and administrative operations staff to develop agreements with the interfacing organizations and the system

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[39] An application service provider (ASP) is a company that offers access over the Internet to applications and related services that would otherwise have to be developed and operated within an organization's own data center. One of the advantages of ASPs is that they can cost-effectively provide application services that would be expensive to develop, install, maintain and operate within a single organization because they centrally provide the application services for many different organizations. These types of providers typically allow some customization of the application for a specific enterprise's use and offer the services on a pay-per-use or yearly licensing basis. While there may be some additional charges for initial customization, these charges are typically significantly less than were an organization to develop its own application.

[40] See the State Administrative Manual (SAM), Chapter 5200, section 5313 (*REQUEST FOR PROPOSAL (RFP)*) and California Multiple Award Schedule (CMAS), Bulletins 35 (October 7, 2002) and 36 (March 1, 2003) for additional information.

development and technical operations vendor to develop the data exchange specifications and data import protocols.

With respect to the agreements established for receiving electricity generation data from control areas and other third party reporters, WREGIS program and administrative operations staff must:

- Coordinate with the generators to ensure they have authorized the control area or reporting entity to release the generation data to WREGIS;
- Coordinate timing, security and general content issues with the control area or reporting entity; and, where applicable,
- Obtain affidavits from those organizations supplying the data that assert the submitted data is accurate and no double counting of renewable energy generation has occurred.

Many control areas and other third party reporting entities that currently have automated systems for tracking and reporting electricity generation data via automated settlement or other information systems are well-positioned to deliver the required data to WREGIS; however, those systems may still require some development effort to deliver all of the data WREGIS requires. For control areas and third party reporters without automated systems, WREGIS will need to establish a secure and easily executed manual method for electricity generation data submission (e.g., using a file transfer protocol to submit tab delimited files adhering to documented specifications). For generators with a very low volume of generation (e.g., customer-side generation), WREGIS will include screens and verification processes permitting these generators to self-report.

The number of reporting entities and potential data differences across these reporting entities are two primary challenges associated with the interfaces supplying electricity generation data to WREIGS. Once WREGIS is fully subscribed, more than 200 separate interfaces will be supplying this important WREGIS data. Where reporting entities have automated systems it is likely some of these systems do not currently report all of the data elements needed by WREGIS or that data elements that are reported are maintained in different formats across systems.[41] The WREGIS Risk Management Plan identifies the risk accompanying this interface and recommends preventative actions and contingency plans.[42] The WREGIS program and administrative operations staff will play a critical role

[41] Energy Commission technical consultants surveyed operators in approximately half of the control areas that could potentially provide electricity generation data to WREGIS in late 2003 and early 2004. These control area operators indicated they could provide the data required by WREGIS. The preliminary operating rules used to guide the development of the functional requirements presented in this FSR incorporated the data requirements, scheduling and other considerations relayed by these control area operators. Further, the WREGIS Operational Rules Committee has proposed a method for reducing the complexity of these interfaces by establishing a standard or master interface control document template that includes the interface specifications and protocols for delivering electricity generation data to WREGIS. Agreements within individual control areas and other reporting entities will focus on establishing their interfaces with WREGIS in a manner consistent with the master interface control document. Variances from this standard will be handled on a case-by-case basis. It is the WREIGS project team's intention to pursue this approach.

[42] See the Software Risk category in the *SIMM Risk Management Worksheet* within the Risk Management

in addressing the challenges associated with this interface by undertaking educational outreach activities in support of developing a collaborative and cooperative relationship with these many reporting entities early in the project.

5.2.8 Testing Plan

The system development and technical operations vendor will be responsible for test planning and management of development-level and system-level testing, including: unit tests; unit integration tests; system tests; system verification tests; system load, volume, and performance tests; security tests; and, back-up and recovery tests. As part of this responsibility, the vendor will implement test environments, prepare and document test cases, define test procedures, and record actual vs. expected test results for tests conducted. The WREGIS project team (or its designees) will participate as needed in defining tests cases, and performing system verification and performance testing. All final vendor testing plans and outcomes will be available for WREGIS QUALITY ASSURANCE Manager review.

The WREGIS program and administrative operations staff (or designees) will be responsible for developing and executing the User Acceptance Test Plan with support from the development vendor. User Acceptance testing will include testing all applicable user, administration and operations manuals/guides and procedures.

5.2.9 Resource Requirements

The RFP procurement approach will be used to secure a vendor to develop and maintain the proposed WREGIS information system solution and to provide the technical infrastructure and services to operate the WREGIS information system once the system is implemented.

Five Leveraged Procurement Agreements (LPAs) will be prepared consisting of California Multiple Award Schedules (CMAS) solicitations resulting in Request for Offers (RFO) for the acquisition of a WREGIS Technical Project Manager, a WREGIS Program Development Project Manager, a Project Oversight Consultant, Configuration Management Consultant, and a Quality Assurance Consultant.

The continuing WREGIS program and administrative operations staff will be hired (2 PYs) as part of the WREGIS project to operate at WECC and WECC will be reimbursed by the Energy Commission for their salaries, benefits and all expenses associated with performing WREGIS program development and administrative operations that exceed the revenues available from WREGIS usage fees.[43] The Energy Commission will contract with WECC to define the terms and conditions of WECC serving as the institutional home for WREGIS.

Energy Commission staff will provide the project resources for the following roles:

Plan section of this FSR**.**

[43] Please refer to section 5.2.23 for additional information on WREGIS usage fees.

- WREGIS Project Sponsor
- WREGIS Program Lead
- WREGIS REP Liaison
- WREGIS Program Support Staff
- Risk Management Manager

The existing WREGIS Stakeholder group will be solicited for volunteers to fill end-user and state regulator roles required for any indicated reviews and for User Acceptance testing. Control areas representing generators who are anticipated to be "early adopters" of WREGIS will be solicited to participate in testing. These project participants will not be compensated. Based on strong stakeholder involvement to date, continuing voluntary stakeholder participation is safely anticipated.

All prospective WREGIS account holders and regulatory or voluntary program representatives will participate in WREGIS training without compensation by the WREGIS project.

See the Economic Analysis Worksheet section later in this FSR for specifics on the number or percentage of person years (PYs) anticipated for each role described above.

5.2.10 Training Plan

Like the User Acceptance Test Plan, the WREGIS User Training Plan will be comprised of sections targeted towards the specific ways in which different roles will interact with the WREGIS information system. At a minimum, the User Training Plan will include components that assist the following roles understand how to interact with the WREGIS information system and how to obtain support for:

- WREGIS program and administrative operations;
- WREGIS account holders;
- State and provincial regulators, auditors, and programs;
- Technical operations; and,
- Interfacing entities.

The WREGIS program and administrative operations staff will be responsible for developing the Training material with assistance from the vendor contracted to develop the information system.

5.2.11 On-going Maintenance

The system development and technical operations vendor will be responsible for meeting the following WREGIS requirement specifically related to system maintenance and operation:

> Requirements Reference 10-001: Allow account holder access to conduct account management activities during any time of the day, seven days a week except for those times during which scheduled system transactions or unexpected system problems disallow account holder access (e.g., back-ups; routine maintenance).

The vendor is responsible for responding to WREGIS information system software problems and operating environment software, hardware and telecommunications problems in a manner to support this requirement.

Maintenance of the WREGIS information system will be specified in the system development and technical operations contract and has been included in the projected costs. Service level agreements with respect to the requirements to maintain the technical infrastructure in which the WREGIS information system will operate will also be specified in this vendor's contract and are subsumed in the projected costs.

WREGIS program and administrative operations staff will track and maintain service requests to facilitate future modifications and enhancements to WREGIS. Service requests will be reviewed and prioritized by the WREGIS Governance Committee based on recommendations of the WREGIS program administrative operations staff and the WREGIS Stakeholder Advisory Committee.

5.2.12 Information Security

The system development and technical operations vendor will ensure that the WREGIS information system security is supported at the authentication, authorization, and accounting levels. A secured socket layer (SSL), transport layer security (TSL) or an equivalent protocol will be used to manage the security of the internet communications required of the WREGIS web-based information system solution.

The development vendor will also ensure the functionality required to support the following specific WREGIS requirements is implemented in support of information security:

> Requirements Reference 10-002: Allow only authenticated users to access WREGIS Account data, where authentication is controlled via WREGIS log-ins and password assignments in conjunction with digital certificates implemented in a secured web portal providing access to WREGIS.

> Requirements Reference 10-004: Provide an electronic audit trail of all WREGIS Account modifications. This audit trail will record the date and time of the change, a record of the change itself, and the designation of the party making the change.

The system development and technical operations vendor is responsible for ensuring the physical security of the WREGIS data, both on-site at the data center and off-site (where back-ups are stored).

The data exchange protocol for any WREGIS data exchange (e.g., interface) will, at a minimum, include secured file transfer and data upload processing using encrypted communications.

The WREGIS program and administrative operations staff are responsible for maintaining physical and electronic security of any WREGIS and other program data residing outside of the WREGIS information system.

5.2.13 Confidentiality

While the WREGIS information system will support public access to standard, non-confidential internet-based WREGIS reports, confidential account holder information will only be available to the authorized account holder (or the account holder's authorized agent) or via private reports that may be distributed to third parties authorized by the account holder. Logic will be included in the functionality related to generating the public reports that will disallow a report if the data available to populate the report is so limited as to inadvertently reveal confidential WREGIS account holder data (e.g., a report is requested concerning the MWh of renewable energy generated by a specific type of generator in a given region when only one generator of that type operates in the region).

The WREGIS program and administrative operations staff and the system development and technical operations vendor will, by employment agreement and contract (respectively), maintain the confidentiality of any account holder data accessible to them by virtue of their roles in supporting the program and/or the information system.

5.2.14 Impact on End Users

This information system leverages a business opportunity and does not replace any existing information system. The primary impact of the WREGIS information system in the short-term will be a significant improvement in the California Energy Commission Renewable Energy Program's ability to verify compliance with California's RPS. The Renewable Energy Program will need to develop procedures and processes to use WREGIS data in conjunction with other data to assess RPS compliance and status. Other states and provinces with an RPS or voluntary programs will similarly need to adjust their procedures once generators and retail sellers within their jurisdictions begin using WREGIS to track and register their renewable energy certificates.

The generators, retail sellers, aggregators and others who elect to become WREGIS account holders will need to learn the new system and maintain their data in that system. However, in light of the fact that the system will make it easier for them to demonstrate compliance and participate in certificate trading (external to WREGIS) and considering that participation is voluntary, it is likely the system will be well-received by those who elect to become WREGIS account holders. Designing the system to operate as a web-based solution means that no special hardware or software is needed for account holders to use the system and provides ease of access in an environment that is increasingly familiar to those who work with computers and the Internet to conduct business today.

The WREGIS Program Lead, the WGA Sponsor, and the WREGIS program and administrative operations staff will all provide "outreach" and education on the WREGIS

program and information system to prospective participants and others who will be impacted by the system. This multi-prong effort should help to reduce the challenges and optimize the opportunities associated with implementing a new system.

5.2.15 Impact on Existing Systems

The California Energy Commission is not currently using information technology in an automated way to track and verify RPS compliance. The California Energy Commission does reference the following data sources as a rudimentary measure to support its interim manual verification process: Western State Tracking System; the Certificates of Specific Generation Program; the Electricity Office database; the Renewable Energy Program databases; and, Energy Information Administration database. However, this interim process cannot feasibly be used to address California's mandated RPS requirements nor meet the associated business objectives (see FSR sections 3.3 and 4.1 for additional information on this topic). Many of the data sources referenced in this interim manual process were created for various CEC programs other than supporting the RPS and will continue to be used for other purposes once WREGIS is implemented. In this respect, these data sources are not impacted by WREGIS.

WREGIS will be established as a new regional, policy-neutral program and system focused on verifying, recording, tracking, and reporting on relevant generating unit and generation data. A WREGIS Certificate will include the type of generating unit and generation data that state regulatory agencies and voluntary programs need in order to determine whether a particular MWh of generation meets their specific renewable energy requirements. The specific methods and tools the individual agencies and programs must revise or develop in order to utilize WREGIS data in their evaluations are considered the responsibility of the individual agencies and programs and not within the scope of the WREGIS program and information system. In this respect then, no existing information systems are impacted by WREGIS because WREGIS' responsibility is to report the data and it is the responsibility of the states and programs to establish the methods and tools for using that data.

5.2.16 Consistency with Overall Strategies

Implementing the WREGIS program and information system to meet the identified business objectives is consistent with the California Energy Commission's Strategic Plan (1997):

> "Use market based mechanisms to implement the Renewables Program created by AB 1890 and other legislative directives to foster renewable technologies which provide public benefits and facilitate their transition to a competitive market." (Strategy III (5), page 11)

5.2.17 Impact on Current Infrastructure

There is no current infrastructure that will be impacted by the information system component of the WREGIS proposed solution since the solution develops and provides

for the on-going technical operations of a new system. The component of the WREGIS solution that involves establishing an institutional home and providing staff to develop and administer the program will have some impact on WECC's current infrastructure.

The WREGIS program and administrative operations staff who will be located at WECC will add workstations and supporting technologies into WECC's technical and business environment. In addition, WREGIS' early program development efforts will include extending WECC's business and technical infrastructure with business and technology continuity plans, procedures, and processes and electronic and physical security measures to better ensure the ability of WREGIS staff to meet their first-line support, information, and confidentiality responsibilities.

5.2.18 Impact on Data Centers

Since the WREGIS program and information system will not reside in any California state department, the proposed solution will not impact the State of California data centers.

5.2.19 Data Center Consolidation

Since the WREGIS program and information system will not reside in any California state department, the proposed solution will not impact the State of California data center consolidation efforts.

5.2.20 Backup and Operational Recovery

The WREGIS program and administrative operations staff, in conjunction with the system development and technical operations vendor, will develop and test system backup and operational recovery plans that are consistent with State Administrative Manual section 4843.1 Agency Operational Recovery Plan (revised 6/03) and State Information Management Manual Section 140 Operational Recover Plan Topic Outline.

These backup and operational recovery plans and processes will also be consistent with the following WREGIS requirements:

> Requirements Reference 10-005: Allow ad hoc backup of WREGIS data as requested by the WREGIS Administrator and allow WREGIS data that has previously been backed up to be restored to WREGIS when requested by the WREGIS Administrator.
>
> Requirements Reference 10-006: Establish well-defined, tested, and documented routine backup and recovery processes. Ensure system backup and operational recovery plans and processing are consistent with California State Administrative Manual section 4843.1 Agency Operational Recovery Plan (revised 6/03) and State Information Management Manual Section 140 Operational Recovery Plan Topic Outline.

5.2.21 Public Access

Non-confidential WREGIS data will be accessible via a publicly accessible website. This data will include:

- Reports on WREGIS account holders and WREGIS registered generating units.
- Reports on summary level WREGIS Certificate activity, selecting from among four standard public report types and specifying the date range and the sort sequence of the data fields on the report. Each standard public report will include generating unit data and information on the associated energy generation without identifying the specific generating units or corresponding WREGIS Accounts. The four standard report types include: Certificates Created, Certificates Transferred, Certificates Retired, and, Certificates Reserved or Imported or Exported to a Compatible Tracking.

5.2.22 Costs and Benefits

The total WREGIS project costs for the proposed solution are $7,508,710 spanning the 17-month procurement and development period and four years of post-implementation operations. Please refer to the Economic Analysis Worksheet section of this FSR for the detail underlying these costs.

The benefits of the proposed solution lie in its support of the WREGIS business objectives as described earlier in this FSR.

5.2.23 Sources of Funding

No budget augmentation is required to fund this project. The *Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund* will fund the initial project costs, including one-time project costs and the continuing costs for up to four years once WREGIS is operational.

The model for financing WREGIS' continuing operations once the program and system are implemented anticipates collecting usage fees from WREGIS participants. The goal is for WREGIS to be financially self-sufficient for continuing operations within the first three-to-five years of operation while at the same time keeping the fees low enough to encourage participation.

The WREGIS Institutional Committee is working with the WREGIS sponsors and stakeholders to establish a usage fee structure and to estimate income from these fees based on projected WREGIS participation over time. The estimated income from these fees is anticipated to off-set operating expenses and lower the funding required from the Energy Commission to cover continuing operating costs during the three-to-five year period during which WREGIS establishes financial self-sufficiency (e.g., when usage fees are fully able to cover all continuing operating expenses). These estimated off-sets are reflected in the See the Economic Analysis Worksheet section later in this FSR.

5.3 Other Alternative Solutions Considered

The alternative approaches focused primarily on providing the information system solution; however, alternatives for WREGIS' technical operations as well as alternatives for the institutional home and program administration were considered as well.

Cost estimates were developed only for those alternatives that met the business objectives and functional requirements.

5.3.1 Information System Acquisition and Technical Operations Alternatives

The alternatives analysis considered both the information system acquisition and the technical operations support once the system was operational. Sections 5.3.1.1 – 5.3.1.5 describe the information system acquisition and development alternatives and section 5.3.1.6 discusses the alternative considered for technical operations.

5.3.1.1 Continue Manual Processing

SB 1078 directs the Energy Commission to develop a tracking and registry system to assure RPS compliance. As described in the Sections 3.1 and 3.2 of this document, the Energy Commission is currently tracking RPS compliance via a manual system that compares voluntary and self-reported IOU data with various state and federal databases to verify RPS compliance. This manual approach is limited in scope and does not meet the goals of SB 1078. Given the volume of electricity sales and participants in the electricity market in WECC, a manual system is not feasible. In addition, the manual system does not establish property rights to the renewable energy attributes, thus creating an environment in which reported renewable energy claims could exceed the energy that was actually generated.

Advantages

- No advantages were found in continuing the manual process.

Disadvantages

- Does not meet the legislative mandate of SB 1078.
- Does not meet the WREGIS business objectives or functional requirements.
- Provides a California-only solution, which is not optimal in a regionalized energy market.

5.3.1.2 Integrate Existing Energy Commission and Federal Databases

As described in the Baseline Analysis Section, the Energy Commission currently uses the following databases in a manual reconciliation process to verify California RPS compliance.

- IOU's annual report (an Excel spreadsheet);
- EIA database containing self-reported energy data;

- Energy Commission Electricity Analysis Office database (voluntary and self-reported);
- Energy Commission Renewable Energy Program databases (voluntary and self-reported capacity and electric energy purchased); and,
- Western States Tracking System (California, Washington and Oregon information derived from a variety of federal data sources).

This alternative would attempt to integrate these databases and automate the verification of California RPS compliance.

The Energy Commission would contract for the integration and automation effort and fund the continuing maintenance and operating costs.

Advantages

- Builds on existing Energy Commission knowledge and technologies.

Disadvantages

- Does not meet the legislative mandate of SB 1078.
- Does not meet the WREGIS business objectives or functional requirements.
- Provides a California-only solution, which is not optimal in a regionalized energy market.
- Existing databases are not scalable to handle the required volume of transactions and would require significant manual verification.

5.3.1.3 Purchase and Modify a Commercial off the Shelf (COTS[44]) Product

Purchase a commercial, off-the-shelf (COTS) product that, while not specifically designed as a renewable energy generation tracking and registry system, includes some of the functionality required by WREGIS. COTS products for financial accounting, commodity trading, and banking meet some of the WREGIS accounting requirements. However, these types of products were developed for different problem domains and

[44] The term *Commercial Off-the Shelf* (*COTS*) has a broad definition within the computer industry but is generally used to describe software or hardware products that are ready-made and available for sale to the general public. Typically these types of products are sold in many copies with minimal change anticipated and, as a consequence, are typically much less expensive than developing a new software system or hardware product. COTS products vary by the degree to which they can be modified and by whom (e.g., the product's vendor vs. the purchaser). Examples of typical COTS software products include operating systems, word processing, e-mail programs, and home accounting systems. Generally a COTS product is purchased with the intent that it will be used "as is" or with minimal change. When significant modifications are required to this type of a product, the term *MOTS* is often times used to describe this type of solution (*Modified Off-the-Shelf*). Because a renewable energy generation tracking and registry system addresses a specific market niche, is not a product anticipated to be of interest to the general public, and is not expected to be sold in many copies, the COTS and MOTS terms are not used to describe the Proposed Solution within this FSR.

would, as a consequence, require extensive structural modifications to meet WREGIS requirements.

The Energy Commission would purchase the base system, contract with a vendor to modify it to meet WREGIS requirements and retain the rights to the resulting system.

Advantages

- Builds on an existing commercial product.

Disadvantages

- Would require extensive system modifications in an attempt to meet the legislative mandate of SB 1078. Even with extensive modification, the requirements may not be completely met.
- No existing COTS product meets the WREGIS requirements. Even a "best fit" product would require extensive modification, increasing the development risk, development cost, and schedule due to uncertainty about the ease and efficiency with which the system can be modified and the potential lack of technical documentation to support modification efforts.
- It is possible that a vendor other than the vendor that developed the base COTS system could be selected to modify the system. Successfully modifying the system relies on locating a system development vendor qualified to understand the base system, WREGIS' requirements, and optimally modify the base system to meet WREGIS requirements. The additional effort required to learn the base system would increase both the schedule and the cost.
- Potential for end-user and regulatory user dissatisfaction when the extensively modified system fails to meet all of the WREGIS requirements.
- Since the system would be built on a modified base, support, maintenance and enhancements to meet future needs would be increasingly difficult.
- No prior Energy Commission experience providing technical oversight for customizing a base system to produce a system the size and complexity of WREGIS.

5.3.1.4 Build a New System

Contract for the development of a new system to meet the WREGIS-specific business objectives and functional requirements.

There are several national and international vendors who have experience in developing renewable energy generation tracking and registry systems using Internet technologies and contemporary development techniques.

The Energy Commission would contract for the system development and retain the rights to the resulting system. Usage fees would be collected to fund continuing system maintenance and operations.

Costs
Based on market survey, costs of existing similar systems, and other analysis, the one-time system development costs associated with this alternative are estimated to be $4,937,993 and total WREGIS project costs are projected to be $11,348,710.

Advantages

- Meets the legislative mandate of SB 1078.
- Increased end-user and regulatory-user satisfaction due to maximum alignment of the system with WREGIS' business objectives and functional requirements.

Disadvantages

- No prior Energy Commission experience providing technical oversight for developing a system the size and complexity of WREGIS.
- Likely to require a longer development and implementation schedule than other evaluated alternatives.
- Increased risk of scope expansion and an extended development schedule.
- Higher development and maintenance costs than modifying an existing system.

5.3.1.5 Contract with an Application Service Provider to Supply Data System Services

Establish a contract with an application service provider (ASP) to supply data system services to support WREGIS' requirements for generating and tracking certificates based on renewable energy throughout WECC.

Even though vendor marketing materials seem to suggest an ASP capability exists in the industry, research failed to identify a currently functioning ASP for renewable energy generation tracking and registry in the United States. The ASP approach is somewhat similar to that used to provide renewable energy generation tracking and registry in at least one other region within the United States; however, that regional system is not a true ASP model since the institutional home ultimately retains the rights to the software and contracts for the technical operation and support. Further it is not clear that that vendor provides the same services to other institutions or organizations at this time.

This alternative includes an initial "customization" of services period during which the ASP configures and, potentially, modifies their information system to align with WREGIS' specific requirements. Once the ASP confirms service delivery consistent with the WREGIS requirements, they would provide continuing system operations and maintenance on a for-fee basis. The Energy Commission does not purchase software nor do they retain any information system rights. Under most ASP models, the Energy Commission (and, subsequently, WECC) would have rights to the WREGIS data were the ASP contract to terminate.

The service contract would initially be funded and managed by the Energy Commission. Once the service is operational, WECC would take over contract management and begin collecting usage fees to fund the continuing operations and potential enhancements.

Advantages

- Meets the legislative mandate of SB 1078.
- Increased end-user and regulatory-user satisfaction due to the potential for significant alignment of the system services with WREGIS' business objectives and functional requirements.
- Expertise exists in the market place to perform this service.
- Could result in the shortest development time, engender the least development risk and require less "up front" costs if the vendor is able to meet WREGIS needs by configuring an existing data system and service model using knowledgeable vendor staff.

Disadvantages

- The market survey failed to identify a qualified vendor capable of *and* interested in supporting an ASP model. Although several vendors describe what appears to be an ASP-like service for renewable generation tracking and registry in their marketing materials, a market survey did not return any estimated cost information for an ASP model.
- Since the Energy Commission does not own the rights to the system, if the ASP goes out of business or for some other reason the contract is terminated, California and WECC would be in essentially the same position they are today with respect to not having an information system to address registering and tracking renewable energy generation certificates.
- Because it may be more difficult to administer the flexibility required for providing this service throughout a region representing the scope and diversification of WECC, there is a potential for higher ongoing cost from the service provider.
- No tangible assets to show for the financial expenditures.

5.3.1.6 Technical Operations Supported by State Data Center

The proposed solution contracts with the development vendor to provide continuing technical operations once the WREGIS system become operational. The alternative considered to this approach involved contracting with California's Teale Data Center to provide these services. [45] Under the Teale Data Center alternative, the Energy Commission would initially be financially responsible for paying for the Teale Data Center services. Once WREGIS were operational, usage fees would be collected to fund continuing technical operations.

[45] Information system alternatives Manual Processing, 5.3.1.1 and Integrate Existing Databases, 5.3.1.2 would not require technical operations support. Information system alternative, Contract with an ASP, 5.3.1.5 would include this support as a component of the ASP contract.

Advantages

- Leverages existing state data center resources.
- Allows the Energy Commission the ability to more closely monitor the operations and maintenance of the system software since it would be housed locally (supporting closer control over California tax dollars and investment).

Disadvantages

- Housing the system in California would not be acceptable to all stakeholders within the Western region. Many states are wary of California unduly influencing the development of WREGIS and creating a California-specific solution. Housing WREGIS in California would amplify their concerns.
- Could result in lower WECC-wide participation. WREGIS must be "policy neutral." If operated by the State of California, WREGIS may be construed to be a California solution, not a WECC-wide solution.

5.3.2 Institutional Home and Program Administration Alternative

An alternative approach to addressing the need for the WREGIS institutional home and program administration was defined as the Energy Commission serving as the institutional host for WREGIS, administering the WREGIS program and performing the administrative operations of the WREGIS information system.

Members of the Energy Commission's Renewable Energy Program would provide day-to-day program and administrative operations support.

Advantages

- The Energy Commission would have the ability to more closely monitor the WREGIS program development and administrative operations, thus maintaining closer control over California tax dollars and investment.

Disadvantages

- Housing the program and administrative operations in California would not be acceptable to all stakeholders within the Western region. Many states are wary of California unduly influencing the development of WREGIS and creating a California-specific solution. Housing WREGIS in California would amplify their concerns.
- Could result in lower WECC-wide participation. WREGIS must be "policy neutral." If the WREGIS program were developed and administered by the State of California, WREGIS could be construed to be a California solution, not a WECC-wide solution.
- The Energy Commission does not currently have the staff to provide the day-to-day WREGIS program and administrative operations support.
- The Energy Commission as an organization has had no previous experience performing the type of program and administrative functions envisioned for a system

the size and complexity of WREGIS and this lack of organizational experience pose some operational risk.

6. Project Management Plan

This Project Management Plan (PMP) covers the WREGIS Project acquisition and implementation. WREGIS is a regional renewable energy tracking and registry system that is used to verify compliance with state and provincial renewable policies, prevent double counting, and support voluntary renewable energy markets. The Energy Commission has project management oversight for the WREGIS Project and is responsible for project management, contract management, and will work with WGA on implementation coordination throughout WECC. The Energy Commission is the Project Sponsor of the WREGIS Project and is responsible for administering the programs that will use WREGIS to verify regulatory compliance within California. As such, the Energy Commission is responsible for ensuring that California's regulatory requirements are represented in the requirements established for WREGIS. Once procurement is complete, the project implementation is estimated to take 8 months to complete with a total one-time cost of approximately $2,537,993 spanning the three fiscal years of 2004/05, 2005/06, and 2006/07.

The PMP is a living document, and is expected to change as the project progresses. Throughout the life of the project, all components of the PMP will be reviewed and updated as appropriate.

6.1 Project Manager Qualifications

The Energy Commission will assign a WREGIS Program Lead, a WREGIS Technical Project Manager, and a WREGIS Program Development Project Manager with the combined skills and knowledge to lead this effort through implementation. These individuals will manage the WREGIS Program development and system implementation project. In addition to the program lead and project managers, the WREGIS Project Team will consist of Energy Commission Renewable Energy Program staff and the WREGIS Administration Operations staff.

Rasa Keanini is the California WREGIS Program Lead responsible for the program and contract management functions of the WREGIS Project. She has six years experience with increasing responsibility at the California Energy Commission. She spent three years working as the assistant lead on the Customer Credit Program, an incentive program with a $75 million budget to advance the renewable energy retail market. She was promoted to lead of the Customer Credit Program at the end of 2001 and continued to act as project lead until the Customer Credit Program was discontinued in March of 2003. At that time, Rasa Keanini was promoted to Energy Specialist II to design and implement the tracking and registry system mandated by Senate Bill 1078 and has been the project manager responsible for the feasibility study of WREGIS. These activities have focused on coordinating the interests and requirements of diverse stakeholders throughout the Western Interconnection, representing California's needs, and completing a thorough analysis of WREGIS requirements. Rasa brings excellent communication, negotiation, and collaboration skills to the WREGIS Project.

The Energy Commission will contract with an experienced IT project management consultant to perform the WREGIS Technical Project Manager role. This individual will

have a minimum of 5 years experience in managing IT projects similar in size and complexity to WREGIS, will have a current Project Management Professional (PMP) certification by the Project Management Institute or similar comparable project management certification, and will maintain current Institute of Electrical and Electronics Engineers (IEEE) CSDP (Certified Software Development Professional) certification or other comparable software engineering certification. The WREGIS Technical Project Manager's qualifications will include:

- A proven track record in managing IT development projects of a similar size and complexity;
- Experience in IT project management and scheduling tools;
- Experience with the application of software development methodologies and iterative development strategies;
- Familiarity with the State of California State Information Management Manual (SIMM) and State Administrative Manual (SAM) and the application of both on IT project policies and practices;
- Experience in working with and managing vendor development;
- Demonstrated written and oral communication skills and the ability to effectively communicate with a diverse group of stakeholders; and,
- Negotiation and conflict resolution skills.

The Energy Commission will contract with an experienced project management consultant to perform the WREGIS Program Development Project Manager role. This individual will have a minimum of 5 years experience in managing business process or program development projects similar in size and complexity to WREGIS, will have a current Project Management Professional (PMP) certification by the Project Management Institute or similar comparable project management certification as well as training or certification in business process development (BPD).

The WREGIS Program Development Project Manager's qualifications will include:

- A proven track record in managing definition, planning, and development of a program of similar size and complexity;
- Familiarity with WECC policies and the WREGIS Program and envisioned system;
- Experience in project management and scheduling tools;
- Experience in business process and program development methodologies and tools;
- Demonstrated written and oral communication skills and the ability to effectively communicate with a diverse group of stakeholders; and,
- Negotiation and conflict resolution skills.

6.2 Project Management Methodology

Effective project management and control is essential to the successful implementation of a regional system such as WREGIS. It is the responsibility of the WREGIS Technical and Program Development Project Managers, in collaboration with the WREGIS Program Lead, to ensure that the project progresses on schedule, stays within the established scope and budget, and meets all of the contract requirements.

The Energy Commission uses a standard project management methodology[46] derived from government and information technology industry standards and best practices, including:

- IEEE, Standard for Information Technology Software Lifecycle Processes;
- Software Engineering Institute (SEI), System Acquisition Capability Maturity Model;
- Project Management Institute (PMI), Project Management Body of Knowledge; and,
- State Information Management Manual (SIMM).

The Energy Commission's project management methodology identifies seven primary phases, which depict the major steps in the system acquisition and implementation and are comprised of many milestones:

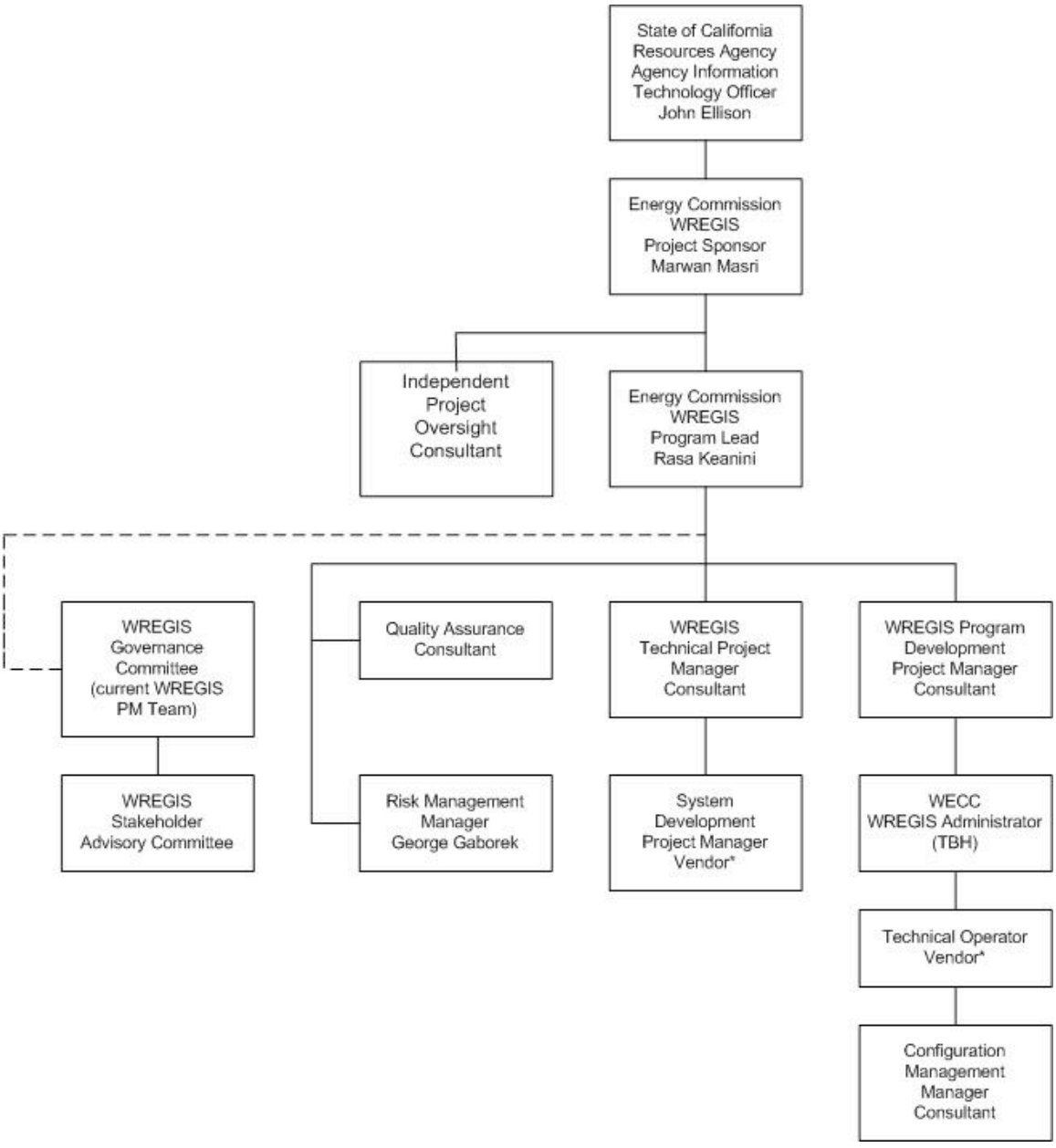
1. **Initiation** phase includes all the activities necessary for the project to define the system concept and get approval to start the project from Energy Commission management, the Resources Agency, the Department of General Services (DGS), and the Department of Finance (DOF).
2. **Procurement** phase includes all the activities necessary for the project to develop a Request for Proposal (RFP), select a vendor, and award a contract to a contractor who can develop the system in accordance with the system requirements and master project plan.
3. **Planning** phase includes all the activities necessary for the project to establish the staffing infrastructure and stakeholder accountability, along with all the project plans, including the appropriate levels of pre-planning documentation for the follow-on phases (e.g., system development, system implementation, maintenance and operations, and closeout).
4. **System Modification** phase includes all the activities necessary for the project to ensure the successful modification of the system up to the point where it is ready to be placed into production. Activities include approval of project initiation, requirements, design, coding, system testing and user acceptance testing.

[46] The Energy Commission project management methodology is based on the project management methodology developed by Knowledge Structures, Inc.

5. **System Implementation** phase includes all the activities necessary for the project to transition to the technical operations staff and WREGIS program and administration staff. It involves business process reengineering, site preparation, pilot operations, training, conversion and system implementation.
6. **Maintenance and Operations** phase includes all the activities necessary for the project to monitor the ongoing operation of WREGIS and performance against contract requirements.
7. **Closeout** phase includes all the activities necessary for the project to bring closure to the project effort at the end of the contract term, to transition to a new contract or system, to capture lessons learned and to ensure that project information is properly archived.

Currently there is no existing WREGIS Program within WECC. In support of developing and implementing the new WREGIS Program and the staff who will be responsible for administrative operations of the program and the system, the WREGIS project management methodology will be augmented with an eighth phase, entitled "WREGIS Program Development." This phase will commence at the same time as the Planning phase and will focus exclusively on developing the program infrastructure, procedures and practices required to define and implement the program and its staff. The WREGIS Program Development Project Manager will lead team project resources on program-specific development activities in parallel with the system development and implementation activities managed by the WREGIS Technical Project Manager.

6.3 Project Organization



TBH = To Be Hired
*A single vendor will be contracted with to provide the system development and technical operations services.

See Section "9. Appendix" for additional organization charts for the Energy Commission and WECC.

Roles and Responsibilities

The Energy Commission, as the sponsoring organization, is responsible for the success of the WREGIS Project and for ensuring that California's Renewable Energy Program policies are supported by WREGIS. As such, the Energy Commission is the point of contact for state agencies and the State Legislature regarding Renewable Energy Program policy issues. The Energy Commission Renewables, Energy Efficiency, and Demand Analysis Division, which houses the Renewable Energy Program, is responsible for day-to-day Project Sponsor and project management activities. Energy Commission responsibilities include:

- Monitor milestones, activities, timelines, resources, budgets and critical path;
- Implementation and operations;
- Contract monitoring, and management;
- Coordination and facilitation of WECC-wide implementation; and,
- Communication and coordination of project stakeholders.

Four essential groups are directly involved in implementation of the WREGIS Project: the WREGIS Project Team, the vendor development team, the Project Sponsor and the WECC stakeholders. These four groups have primary roles and varying levels of responsibility for the success of the WREGIS Project. The following describes the various roles in these groups and delineates their responsibilities.

WREGIS Project Sponsor: The WREGIS Project Sponsor has the ultimate responsibility for the project's costs and benefits and is the Chief, Renewable Energy within the Renewables, Energy Efficiency, and Demand Analysis Division of the Energy Commission. The WREGIS Project Sponsor sets the objectives and project prioritization, ensures that the project is adequately funded, provides direction with staffing, reviews and approves project plans; monitors project implementation including participation in risk analysis and mitigation and the change management process. This individual assists with dispute resolution and acts as the executive contact for the project.

The WREGIS Project Sponsor will identify the Energy Commission Renewable Energy Program staff that will participate on the WREGIS Project Team. These staff will bring California RPS expertise as well as a familiarity with the WREGIS program and envisioned system.

WREGIS Program Lead: The WREGIS Program Lead is the project's spokesperson responsible for communicating program strategy, benefits, direction, status, and recommendations to the State of California and WECC stakeholders. The WREGIS Program Lead is the Renewable Energy Program advisor to the Project Sponsor, WREGIS Program Development Project Manager and WREGIS Technical Project Manager on program aspects of the WREGIS Project and ensures that the State of California and WECC stakeholders agree to project commitments. This individual works with the WREGIS Program Development and WREGIS Technical Project Managers to define project policies and procedures, and participates in the following: development

and review of the project plan; review of project status; reviews the results of quality assurance (QA) reviews; review and approval of system changes; and, identifies projects risks and establishes mitigation procedures. This individual is ultimately responsible for ensuring that the post-implementation report is completed.

WREGIS Technical Project Manager: It is the responsibility of the WREGIS Technical Project Manager to oversee and coordinate vendor development team efforts with those of the WECC and Energy Commission team members. A key part of this role is the development of detailed project plans, and tailoring software development and project management methodologies to reflect WREGIS project needs. The WREGIS Technical Project Manager is an internal advisor to the Project Sponsor and Program Lead on technical aspects of the WREGIS Project. The WREGIS Technical Project Manager works closely with the Project Sponsor and the WREGIS Program Lead to ensure that adequate resources are applied. The role of the WREGIS Technical Project Manager includes the following activities: This person coordinates with the Configuration Management (CM) and Quality Assurance (QA) teams to define and implement quality assurance and CM plans. In addition, the WREGIS Technical Project Manager conducts on-going risk analysis, tracks and manages progress, and reports progress to the WREGIS Program Lead, Project Sponsor and key stakeholders. This individual is ultimately responsible for the project definition, implementation, control, and closure activities. The WREGIS Technical Project Manager works closely with the WREGIS Program Development Project Manager to keep the two project work efforts aligned.

WREGIS Program Development Project Manager: The WREGIS Program Development Project Manager will represent the WREGIS Program perspective with respect to scope and schedule issues during the project. The WREGIS Program Development Project Manager will be responsible for ensuring procedures, processes, and program infrastructure needed for establishing and promoting the WREGIS program and the day-to-day administrative operation of the program and the information system are defined, developed and implemented in parallel with the system. A key part of this role is the development of detailed project plans for the WREGIS program development work and leading project staff in performing required work (including the WREGIS program and administrative operations staff once hired). The WREGIS Program Development Project Manager is an internal advisor to the Project Sponsor and Program Lead on program aspects of the WREGIS Project and works closely with the both to ensure that adequate resources are applied. The WREGIS Program Development Project Manager coordinates with CM, QA and Risk Management project resources in support of those key control activities and works closely with the WREGIS Technical Project Manager to keep the two project work efforts aligned.

Independent Project Oversight Consultant (IPOC): The Independent Project Management Oversight function for WREGIS will be contracted out to an experienced project management consultant. The activities of the IPOC will comply with the DOF's Information Technology Project Oversight Framework's, "Minimum Requirements for Project Management Practices and Processes," State Information Management Manual 45, and DOF's Budget Letter 04-04. This individual is responsible for the oversight of all portions of the WREGIS project. This individual will review, monitor, track, and

critically assess the management and technical aspects of the project including risk management. S/he will conduct compliance reviews at key points in the project, and document deficiencies in the format required by the Project Oversight Report Information Technology Project Oversight Framework. Following the reports, the IPOC will verify that appropriate actions have been taken and incorporated into the WREGIS project management processes.

System Development Project Manager and Team: The System Development Project Manager is responsible for recommending the technical solution and implementing this solution within the contract specifications. The System Development team will perform all aspects of the development life cycle, including: analyzing and documenting the detailed WREGIS requirements, developing the design and interface specifications, establishing the project's engineering facilities and environments, building and testing the product, conducting acceptance tests, deploying the product, and conducting training sessions as needed. In addition, the System Development Team is expected to participate in WREGIS team processes such as developing estimates and reporting on the schedule, participating in QA and CM planning, conducting team reviews, contributing to the risk management processes, and in the lessons learned sessions.

Configuration Management Manager: The Configuration Management (CM) Manager is responsible for ensuring that the WREGIS project implements configuration management best practices. As such, this individual will evaluate the WREGIS project configuration management needs and define and implement an approach consistent with the project requirements and state organization standards. They will create the configuration management plan identifying items to be placed under CM control and will recommend appropriate procedures and tools to baseline and track these items. The CM Manager is expected to lead the WREGIS Project Change Control Board and to participate in all project team change control activities. In addition, this individual will maintain the project library, managing access and distribution of project documents. The process used by the Change Control Board will be in consistent with the policies and procedures prescribed by SIMM 30 Special Project Report Preparation Instructions.

Quality Assurance Consultant: The Quality Assurance (QA) Consultant is responsible for ensuring that the project and the vendor implements best practices with respect to QA. This individual will review the vendor QA procedures to ensure that they are documented and followed, and is responsible for ensuring that the project technical documentation (e.g. requirements documentation, design specifications, and risk management documents) are delivered and conform to standards. In addition, the QA Consultant will conduct training and orientation for the project team on QA practices and will keep the quality metrics for the project. As part of this responsibility, the QA consultant will ensure that all deliverables are reviewed by the appropriate groups, will coordinate and schedule the formal reviews and audits, and will participate in informal reviews and lessons learned sessions.

Risk Management Manager: The ITSB Project Development and Support Office of the California Energy Commission will provide WREGIS risk management. The Risk Management Manager is responsible for coordinating and tracking the identification, qualification, quantification, and mitigation planning activities of risks associated with

the WREGIS Project. These tasks are ongoing throughout the life of WREGIS. This individual ensures that all appropriate risk information is captured in a WREGIS Risk Log and provides ongoing reporting to the WREGIS Project Sponsor, WREGIS Program Lead, WREGIS Technical Project Manager, and key stakeholders.

WREGIS Governance Committee: The WREGIS Governance Committee is composed of representatives from the Energy Commission, WGA, WECC, and other stakeholders. Once WREGIS is operational, the WREGIS Governance Committee is responsible for the recommendation of budgetary concerns, enforcing policies, and approving functionality, security, and scope decisions regarding WREGIS. In order to be represented in project decisions, this committee will provide feedback on program development, policies, functionality, security and scope to the WREGIS Program Lead.

The WREGIS Stakeholder Advisory Committee: The WREGIS Stakeholder Advisory Committee (SAC) will be composed of industry and state/provincial participants who will serve without compensation. Once WREGIS is operational, the SAC may address any topic that is, in its judgment, relevant to the operation of WREGIS. The SAC will develop recommendations based upon a majority vote of its members to forward to the WREGIS Governance Committee Chair. As noted previously, the WREGIS Governance Committee will provide feedback on program development, policies, functionality, security and scope to the WREGIS Program Lead during the WREGIS program development and system implementation project. Similarly, during the project the SAC will advise the WREGIS Governance Committee concerning any of the topics forwarded for its consideration.

WREGIS Administrator: The WREGIS Administrator represents the WREGIS program and administrative operations staff, which will be located at WECC. Once the system is operational, the WREGIS Administrator will be responsible for managerial oversight of the WREGIS system development and technical operations vendor hired to maintain and operate the WREGIS system and for carrying out administrative functions and duties required for the successful operations of WREGIS. For example, in addition to managing the WREGIS system development and technical operations vendor, the administrative staff will manage WREGIS finances, manage communication and outreach, assist in resolving disputes, create reports using system data, and conduct training. The WREGIS program and administrative operations staff will provide primary support for WREGIS program inquiries and first-line support for WREGIS system usage questions and problems. The WREGIS Administrator will also receive operational change suggestions from system users (and the WREGIS system development and technical operations vendor), present those to the WREGIS Governance Committee and communicate approved changes to the WREGIS system development and technical operations vendor. During the project, the WREGIS program and administrative operations staff will be the key resources managed by the WREGIS Program Development Project Manager to develop the procedures, process and program infrastructure needed for WREGIS program development and administrative operations.

WREGIS System Development and Technical Operations Vendor: The Energy Commission will contract for the services of a WREGIS system development and technical operations vendor to provide and maintain the technical environment and to

perform the day-to-day technical operations of the WREGIS system hardware and software. For example, implementing approved technical changes to the rules, issuing reports on demand and running routine and on-request archive, back-up and restore procedures and user assistance. The WREGIS system development and technical operations vendor will provide and maintain all hardware and software, and will be the second-line contact for WREGIS system usage questions or problems.

6.4 Project Priorities

Managing the WREGIS Project will require the balancing of three factors: schedule, scope, and resources. These factors are interrelated; a change in one of them causes the others to change as well. In order to implement a fully functional WREGIS that will meet the needs of WREGIS stakeholders, the Energy Commission has set the following priorities for the delivery of WREGIS by fiscal year-end 2005/2006.

Schedule	Scope	Resources
Constrained	Improved	Accepted

The schedule of the WREGIS Project is constrained. Schedule is an extremely important factor, and the goal is to have WREGIS developed and implemented expeditiously in order to meet the regulatory mandate of SB 1078.[47] However, there are various factors that may affect project schedule. The project implementation schedule will not be finalized until after the system development contract is awarded.

The scope of the WREGIS Project is improved to ensure that WREGIS meets the needs of the various participants and regulatory entities throughout WECC. The project scope is defined by the requirements delineated in the RFP and the resulting contract. The WREGIS requirements are subject to the Change Management process defined below in item 6.8.

The resources of the WREGIS Project are accepted (may need adjustment) to ensure that the project meets its 2006 implementation date.

6.5 Project Plan

Project Scope

The table below identifies those areas of focus that are the scope for the WREGIS implementation as well as those areas that are not considered to be part of WREGIS implementation activities. This table provides the basis for evaluating any future change to the WREGIS Project.

[47] During the 2003 recall election, Arnold Schwarzenegger's campaign website called for accelerating implementation of the RPS, to reach 20 percent renewables by 2010, rather than 2017, and set the state on course to derive 33 percent of its power from renewable sources by 2020.

Scope Related to System Functional Requirements

In Scope	Out of Scope
1. Operational WREGIS System including the following functionality: • Account Holder Registration and Updates • Generating Unit Registration and Updates • Establishing and Maintaining WREGIS Subaccounts • Creating and Depositing WREGIS Certificates • Managing WREGIS Certificates • Access Assignments and Updates • Reporting on WREGIS Data and Related Features	• Conversion of any pre-existing data sources containing potential account holder information
2. Data Interfaces including: • Electricity generating data from reporting entities in accordance with the specifications established in each Interface Control Document • Import of renewable energy certificate data from Compatible Tracking and Registry Systems in accordance with the appropriate Compatible Tracking and Registry System Exchange Agreement • Export WREGIS Certificates to Compatible Tracking and Registry Systems in accordance with the appropriate Compatible Tracking and Registry System Exchange Agreement	• Conversion of any pre-existing data sources containing potential generating unit information
3. System Availability, Security, Audit and Backup Procedures	• Ensuring any state- or province-specific regulations are applied in transferring, reserving, retiring, reserving, importing or exporting certificates.

Scope Related to Technical Operations Requirements

In Scope	Out of Scope
1. Technical infrastructure needed for WREGIS operations	
2. Technical support services required to operate the WREGIS application	
3. Technical support and assistance	

Scope Related to Establishing the WREGIS Program within WECC

In Scope	Out of Scope
1. Develop detailed WREGIS Administrative Operations and Program Requirements	
2. Finalize contractual and funding agreements between WECC and the Energy Commission and formalize WREGIS Governance Committee definition	
3. Establish WREGIS administrative staff job descriptions and recruit and hire staff	
4. Define and implement WREGIS Administrative Operations and Program Processes, Procedures and Controls	
5. Develop and deploy WREGIS marketing and outreach campaign	

Project Assumptions and Constraints

- WREGIS is seen as the most cost-effective way to meet RPS compliance by participants.
- WREGIS will be self-funded within 3 years after implementation.
- WREGIS system development and technical operations will be provided by a single vendor.
- The roles and responsibilities of the WREGIS program and administrative operations staff housed at WECC will be defined and published before the RFP for the WREGIS system development and technical operations vendor is published.
- The procurement cycle to award the WREGIS System Development and Technical Operations vendor contract will take 9 months.

- The procurement cycle to award the five RFOs for project roles will take 2 months each and will be staggered based on the timing for the specific role on the project.
- The WREGIS Administrator housed at WECC will be hired by July 2005.
- The WREGIS Technical Project Manager role will be contracted to an experienced IT project management consultant.
- The WREGIS Program Development Project Manager will be contracted to an experienced BPD or program development project management consultant.
- The Quality Assurance function will be contracted to an experienced QA Consultant.
- The Configuration Management function will be contracted to an experienced CM Consultant.
- The Energy Commission will act as the Program/Contract Manager representing the Energy Commission and the needs of the State of California.
- The WREGIS Project will take 8 months after contract execution through full WECC-wide implementation. Develop will span fiscal years 2004/2005 and 2005/2006.
- Approvals will be received in a timely fashion throughout the project lifecycle.
- Final vendor development deliverables will be of high enough quality that the approval process of 15 business days for WREGIS Governance Committee review, 5 days for vendor revision and 3 days for final review and approval is sufficient time.
- WREGIS will be operational by May 2006.

Project Phasing

The implementation strategy planned for WREGIS has been developed to afford California the best opportunity to maximize success and manage risks. The strategy is based upon the following key considerations:

- The implementation strategy is modeled after successful similar implementations in Texas and New England renewable energy verification and tracking projects, and the lessons learned from both.
- Consideration of the complexity and risks identified within WECC.
- Input from workgroups representing all primary stakeholders impacted by WECC.

Project Phase	Phase Deliverables
Initiation	• Approved FSR • Approved ITPP
Procurement	• RFP for System Development and Technical Operations and Maintenance Vendor • RFOs for WREGIS Technical Project Manager,

	WREGIS Program Development Project Manager, Quality Assurance Consultant, Configuration Management Consultant, and Independent Project Oversight Consultant • Signed Vendor Contracts
Planning	• Refined Project Schedule • Procedures associated with communication, roles and responsibilities, change and issue management, risk management and mitigation, configuration management, and project reporting
WECC WREGIS Program Development	• Detailed WREGIS Administrative Operations and Program Requirements Document • WREGIS Governance Structure and Policies • WECC WREGIS and California Energy Commission Contract • WREGIS Program and Administrative Operations Positions Defined and Staffed • WREGIS Administrative Operations and Program Processes, Procedures and Controls • "Outreach" Marketing Campaign
System Modification	• Final WREGIS Systems Requirements Document • Requirements Traceability Matrix • System Design Document • Modified Code Base • WREGIS End User's Guide • WREGIS Administrative Operations Guide • WREGIS Installation Procedures and Technical Operations Guide • Operational Recovery Plan • System Test Plan and Results • User Acceptance Test Plan and Results
System Implementation	• WREGIS End-User Training Materials • End-User Training Plan • WREGIS Administrative and Technical Operations Procedures Training Materials • WREGIS Administrator Training Plan
Maintenance and Operations	• Service Request Process and Results
Closeout	• Post Implementation Evaluation Report • Project Retrospective Results

Project Schedule

Task Id	Task or Activity	Duration	Milestone	Estimated Completion Date
1	**Initiation**			
1.1	Obtain FSR approval	60 days	FSR Approved	2/25/05
1.2	Obtain DGS ITPP approval	60 days	ITPP Approved	2/25/05
2	**Procurement**			
2.1	Develop and release the RFP and SOW for System Development and Technical Operations vendor. Evaluate the responses and select vendors.	231 days	Signed Vendor Contract	10/21/05
2.2	Develop RFO and SOW for Independent Project Oversight Consultant. Evaluate the responses and select vendor	44 days	Signed CMAS Vendor Contract	6/27/05
2.3	Develop RFO and SOW for WREGIS Program Development Project Manager. Evaluate the responses and select vendor	35 days	Signed CMAS Vendor Contract	6/23/05
2.4	Develop RFO and SOW for WREGIS Technical Project Manager. Evaluate the responses and select vendor	35 days	Signed CMAS Vendor Contract	9/12/05
2.5	Develop RFO and SOW for Configuration Management Consultant. Evaluate the responses and select vendor	35 days	Signed CMAS Vendor Contract	12/12/05
2.6	Develop RFO and SOW for Quality Assurance Consultant. Evaluate the responses and select vendor	35 days	Signed CMAS Vendor Contract	11/7/05
3	**Planning**			
3.1	Develop and distribute change and issue management procedures, project communications plan, risk management procedures, configuration management plan	15 days	Project Infrastructure Established	11/4/05

	and procedures, and progress reporting guidelines			
3.2	Working with vendor Project Manager, WREGIS Technical Project Manager, WREGIS Program Lead, and WECC Project Manager, develop the refined project schedule	10 days	WREGIS Schedule Baselined	10/28/05
4	**WREGIS Program Development**			
4.1	Develop detailed WREGIS Administrative Operations and Program Requirements	90 days	Administrator Requirements Complete	4/25/05
4.2	Negotiate WECC WREGIS and California Energy Commission contract	60 days	Signed WECC-CEC Contract	4/4/05
4.3	Define, recruit and hire WREGIS Administrative staff	60 days	WREGIS Admin Staff Positions Filled	7/27/05
4.4	Refine and implement the WREGIS Governance Structure	120 days	WREGIS Governance Policies Approved	5/25/05
4.5	Define and implement WREGIS Administrative Operations and Program Processes, Procedures and Controls	9 mo	WREGIS Administrative Operations and Program Processes Approved	4/17/06
4.6	Develop and deploy WREGIS marketing campaign	9 mo	Signed WREGIS Participant Contracts	4/17/06
5	**System Modification**			
5.1	Finalize system requirements document	20 days	SRD Technical Review Complete	11/30/05
5.2	Develop system test plan	15 days	System Test Plan Complete	2/3/06
5.3	Develop user acceptance test plan	20 days	User Acceptance Test Plan Complete	3/6/06
5.4	Create systems design document	30 days	SDD Technical Review Complete	1/13/06
5.5	Modify and unit test code base	45 days	Code Complete	3/20/06
5.6	Develop test site infrastructure	30 days	Test Site Established	3/20/06

5.7	Conduct integration, interface, volume, and security tests	20 days	System Test Results Signed-Off	4/17/06
5.8	Develop WREGIS end-user guide	20 days	WREGIS End-User Guide	2/10/06
5.9	Develop WREGIS administration operations guide	20 days	Administration Operations Guide Technical Review Complete	2/10/06
5.10	Develop and test WREGIS installation procedures and technical operations guide	20 days	Technical Installation Procedures and Operations Guide Technical Review Complete	5/15/06
5.11	Conduct user acceptance tests	30 days	User Acceptance Test Results Signed-Off	5/30/06
5.12	Modify and regression test system based on user acceptance results	30 days	User Acceptance Modifications Tested and Signed-Off	6/27/06
6	**System Implementation**			
6.1	Develop end-user training materials	10 days	Training Materials Technical Review Complete	5/30/06
6.2	Conduct end-user training	2 days	Participant Evaluations Indicate Readiness to Administer WREGIS	6/1/06
6.5	Deliver WREGIS to the vendor's technical operations team and provide transition support	5 days	WREGIS Available to WECC Participants	6/8/06
6.6	Implement WREGIS throughout WECC	0 days	WREGIS Operational	6/27/06
7	**Maintenance and Operations**			
7.1	Monitor system results, track and implement system modification requests	13 mo	Service Request Log Established	7/25/07
8	**Closeout**			
8.1	Conduct the project retrospective	4 days	Project Retrospective Document Complete	7/18/06
8.2	Make final payment for software development	30 days	Software Development Vendor Deliverables Accepted and Development Contract Signed-off	9/7/06

			as Complete	
8.3	Archive project files and transition applicable change and issue management materials and history to WREGIS Administrator	5 days	WREGIS Project Documents Archived for Future Project Use and Transitioned to WREGIS Administrator as applicable	9/14/06
8.4	Conduct Post Implementation Evaluation Review	30 days	PIER on File with DOF	8/3/07

6.6 Project Monitoring

Project reporting is a critical tool for the tracking and communication of project activities and status to a variety of interested stakeholders. Within the WREGIS Project, information will be collected so that detail and summary information is available to the WREGIS Program Lead, WREGIS Technical Project Manager, WREGIS Program Development Project Manager, WREGIS Project Team, WECC and the Energy Commission executive management, and the various concerned control agencies. The WREGIS Governance Committee will meet monthly and will provide a forum for project status reporting. The development vendor's Project Manager and WREGIS Project Management Team will report progress, issues and risks to the WREGIS Governance Committee. The development vendor's Project Manager will prepare and submit weekly status reports. Status reports will address the overall project status with respect to the Project Workplan and shall provide progress information on all completed, ongoing and planned project activities. These reports shall summarize any outstanding project issues or obstacles and detail any proposed deviations from planned activities, schedules, budgets, or staffing. Every report will have a current workplan attached that incorporates planned and actual start and end dates, percentage completed, dependencies and critical items.

The development vendor's Project Manager shall prepare and submit monthly written progress reports. The monthly written progress report shall provide a formal written project status report including the work breakdown of tasks, and shall describe overall project progress against approved milestones in the Project Workplan; deliverable status and next month's schedule for review; problems, risks and issues requiring attention, with proposed remedies; and proposed changes to the Project Workplan.

The monthly written reports provided by the development vendor will be the basis of the monthly project status update jointly produced by the WREGIS Technical Project and Program Development Managers to control agencies as appropriate. The monthly project status update will include the following information:

- Significant accomplishments during the reporting period;
- Significant accomplishments anticipated for the following month;
- Problems encountered/resolutions;
- Outstanding project issues;
- Corrective actions required; and,
- Project status (cost, schedule, requirements) compared to baseline schedule.

An experienced project management consultant will be contracted to provide independent project management oversight for WREGIS. The Project Management Oversight consultant will conduct periodic compliance reviews using the DOF's Information Technology Project Oversight Framework's, "Minimum Requirements for Project Management Practices and Processes" and associated checklists to ensure completeness, currency, comprehensiveness, accuracy of the project management processes and deliverables. The Project Management Oversight consultant will work with the QA consultant to coordinate their findings and conduct follow-up reviews to ensure that any deficiencies have been corrected in a timely manner.

6.7 Project Quality

The purpose of Quality Assurance (QA) is to provide adequate assurance that the project products and processes conform to their specified requirements and adhere to their established plans throughout the project lifecycle.

The WREGIS Project will retain a QA Consultant to provide QA support. The WREGIS Project's QA Consultant externally monitors the development effort and internally monitors the WREGIS Project Management Team's efforts. The QA Consultant reports to the WREGIS Program Lead.

The QA Consultant will provide industry expertise to assist the Energy Commission in the resolution of key project issues. The QA Consultant reviews and comments on project documents, deliverables and reports, as required. Major responsibilities of the QA Consultant include:

- Identify technical and management issues/risks and report findings to project management so the issues/risks can be adequately and timely addressed and resolved.
- Ascertain if the best interests of technology objectives for the state are being satisfied through the WREGIS implementation.
- Determine whether WREGIS deliverables conform to requirements.
- Ensure business process, technical requirements, and project management best practices are adequately addressed, documented and employed.
- Verify the development vendor is meeting contractual expectations, following established processes, and addressing variances in the workplans.
- Verify all project stakeholders are keeping their commitments.
- Provide on-site support to the implementation team; monitoring vendor implementation activities; identify and resolves issues; and report implementation progress.
- Evaluate internal project compliance with project standard processes and procedures.

The QA Consultant will assist the Energy Commission Project Oversight Consultant by creating and delivering presentations and reports as required providing information to various stakeholders. In addition, the QA Consultant will review and comment on the project approval/funding documents and updates, and will assist the Energy Commission in responding to state control agencies.

6.8 Configuration and Change Management

The purpose of Configuration Management (CM) is to ensure all work products received or generated by the project are adequately documented, stored and managed. The intent being that any version of an item could be retrieved and/or recreated, if necessary. Controlling changes to the identified items is an important part of CM. The purpose is to ensure that the impacts and rationale for each change are analyzed and coordinated prior to being authorized. Changes, in this context, refer to changing the functionality of an item or adding additional functionality (i.e., changes to the project scope).

The level of formality in the change control process varies from item to item. For hardware, software, and requirements, a formal analysis and approval process is required due to the complexity of the item and the extent of possible impacts. For these items, a Change Control Board will review impacts and grant approvals.

Requirements are a key focus for CM. According to IEEE 1233, "if any changes to the [System Requirements Specifications] baseline are to be made, they should be controlled through a formal CM process. This process includes appropriate negotiation among parties affected by the change and should trigger pertinent risk assessments (e.g., schedules or costs)." Requirements are rarely static. Although it is desirable to freeze a set of requirements permanently, it is often not possible. The state's project requirements are captured and tracked via a Requirements Traceability Matrix. The state recognizes that some system change, over the life of the contract, will be needed. A strict CM process, consistent with IEEE 1233 and described, will be enforced. The impact of proposed new requirements must be evaluated to ensure that the initial intent of the requirements baseline is maintained or that changes to the intent are understood and accepted by all parties affected.

The WREGIS Change Control Board (CCB) is comprised of members from the WREGIS Project Management Team, the vendor's System Architect, Quality Assurance Manager, and the a representative of the WREGIS Governance Committee. The WREGIS CCB will review and provide direction on all change requests that impact the WREGIS Project's resources, schedule, or scope.

The Configuration Management Manager tracks all problem reports and changes from initiation to implementation and will provide detailed tracking of baseline change and change activity on a day-to-day, item-by-item basis. This individual is responsible for generation and distribution of the configuration status accounting reports.

6.9 Authorization Required

- Agency Information Technology Officer, Resources Agency
- California Energy Commission—Approval of funds require approval at an Energy Commission Business Meeting
- Executive Director, California Energy Commission
- Chief Information Officer, California Energy Commission
- Renewables Committee, California Energy Commission
- Executive Director, WGA
- Technology Investment Review Unit, Department of Finance

7. Risk Management Plan

This section describes the Risk Management Plan (RMP) for the WREGIS Project. The RMP identifies the procedures used to identify, analyze, and manage risk throughout the project. In addition to documenting the results of the risk identification and analysis phases, the plan identifies roles and responsibilities for managing risk, describes how risk mitigation activities will be tracked throughout the project lifecycle, and how contingency plans will be implemented.

The RMP describes the WREGIS Project overall approach for risk monitoring and mitigation. It identifies procedures for:

- Initial risk identification and analysis;
- Continuous ongoing risk identification to account for the dynamic nature of project risks;
- Active monitoring of significant and critical risks;
- Executive review of risk management activities; and,
- Developing and executing mitigation strategies and contingency plans.

The WREGIS Project Management Team will update the RMP periodically as a result of continuous process improvement efforts.

7.1 Risk Management Worksheet

The Risk Management Worksheet is a display of the identified risks and key attributes or characteristics for each risk, as described in SIMM, version 1.0, January 1997. Section 200: Project Management Methodology, Subsection 3.10: Risk Management Plan. The Risk Management Worksheet includes:

1. **Risk Category/Event Description**: a description of the risk event and risk type (an example of a risk category is "Personnel"; an example of a risk event is "Lack of expertise in the software/hardware").
2. **Probability**: the likelihood of the risk event occurring (use a decimal value from 0 to 1 (e.g., 0.70) to express the probability of the risk event occurring).

Rating	Statement of Impact	Statement of Probability
.10	Low	Unlikely or highly unlikely
.30	Minor	Somewhat doubtful
.50	Moderate	Better than even chance
.70	Significant	Likely or probable
.90	High	Highly likely or almost certain

3. **Affected Project Area/Element:** the component of the project that will be impacted by the risk event (e.g., schedule, budget, system/project interfaces, hardware, software, etc.).

4. **Preventive/Contingency Measure(s):** the measures or actions that will be taken to minimize the effect of the risk event.

Because of the varied locations and organizations belonging to WECC, the WREGIS implementation presents issues somewhat different than those typically faced by implementation in a single state. WREGIS requires the active participation and cooperation of diverse stakeholders. Successful WREGIS implementation necessitates close cooperation and coordination with generators of renewable energy, retail electric service providers and market participants from several states and provinces who promise to be early WREGIS adopters. The biggest challenges faced by the WREGIS Project team will be the management and coordination of the various stakeholders and the myriad of change management issues that must be resolved.

Figure 1: SIMM Risk Management Worksheet

Project Name: WREGIS	**Prepared by:**			
Project Number:	**Date:** January 14, 2005			
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
Personnel				
While the Energy Commission has had experience performing IT infrastructure projects of significant scope and complexity, it has not had experience in the oversight of large application system development projects. Lack of experience in this arena may lead the organization to underestimate the overhead required for communication and decision-making on WREGIS, with the result that more effort is required than planned.	.70	• Poor communication resulting in rework and additional effort. • Higher cost and slipped schedule due to rework and delayed decisions.	1. Contract for a WREGIS Technical Project Manager to assist the WREGIS Program Lead. The major prerequisite for this role is experience managing large IT projects. 2. During the project initiation phase, define communication paths and key decision points throughout the project. Publish formal Communication Plan during initiation phase. 3. Establish reporting milestones at key decisions points. 4. Working with the WREGIS Project Team and vendor, develop and maintain a roles and responsibilities matrix for clarification and accountability.	1. Ensure that the schedule allows for additional turnaround time on decisions. 2. Reschedule to allow for rework as it occurs and evaluate the need to adjust schedule for future tasks that may experience similar delays due to the impact of this same risk.
The Energy Commission's current technical consultant contract expires June 16th, 2005. If another vendor is rewarded the contract, significant expertise would be lost, and the new vendor would need to learn about the various organizations and their involvement in the project as well as the politics surrounding the project. This could result in schedule delays.	.30	• Schedule delays due to time required to bring the new vendor up to speed on WREGIS. • Schedule delays due to revisiting previously researched and resolved issues. • Decisions based on an unrealistic or incomplete understanding of the politics	1. Require WREGIS-like knowledge as a prerequisite for vendors to bid on the technical consultant contract. 2. Begin to negotiate the new technical consultant contract three months earlier than planned.	1. Add project tasks to inform and train the new vendor as soon as a change in contracts is announced. 2. Bring the new vendor into WREGIS team meetings as soon as the new contract is negotiated.

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
		may require rework, increasing both the schedule and the budget.		
Only two (2) Energy Commission staff representing WREGIS and the Renewable Program subject matter expertise are currently assigned to the project and there are currently no "back-ups" designated for either role. Should either or both of these staff become unavailable to the project, significant expertise would be lost, and the new staff would need to learn the about the various organizations and their involvement in the project as well as the politics surrounding the project.	.30	• Schedule delays due to time required to bring the new staff up to speed on WREGIS and the California Renewables Program's requirements for that system. • Schedule delays due to revisiting previously researched and resolved issues. • Decisions based on an unrealistic or incomplete understanding of the politics may require rework, increasing both the schedule and the budget.	1. Assign and train Energy Commission "back-ups" for both roles once the FSR is approved. 2. An additional PY has been approved for assignment to the WREGIS Project; pursue hiring and training that staff person as soon as possible.	1. Add project tasks to inform and train the back-up staff and new PY as soon as they are assigned. 2. Bring back-up staff and new PY into WREGIS team meetings as soon as they are assigned.
Equipment (None)				
Equipment risks are not expected on this project since equipment and technology for similar software systems are in use at several sites.				
Customer				
There may be problems securing stakeholder feedback and buy-in on a timely basis. Based on their experience to date, WREGIS stakeholders may expect to be involved in all decisions. These stakeholders represent a diverse set of interests and are geographically	.70	• Schedule delays resulting from the need to communicate and gain buy-in from geographically dispersed and diverse interests. • Decisions accepted with lack of consensus may result in	1. Establish a core team (a subset of the WREGIS Governance Committee) representing the WREGIS stakeholders. Each core team member has the responsibility to gather input and represent the interests of his/her area.	1. Ensure that the schedule allows for additional time where stakeholder decisions are required. 2. Implement the project with only partial consensus on decisions.

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
dispersed, increasing the difficulty of reaching timely consensus on decisions. Similarly, due to the intensive stakeholder participation to date, it may be difficult to secure continuing commitments from these same stakeholders, resulting in a loss of key input during the project and potentially undermining buy-in once the system is implemented.		of consensus may result in rework at a later date or in lack of participants when the system implemented	his/her area. 2. Working with the WREGIS Project Team and vendor, develop and maintain a roles and responsibilities matrix for clarification and accountability, including the roles and responsibilities of the WREGIS stakeholder group. 3. Establish and publish a well-defined deliverables review protocol, decision-making process, and change control and issue management procedures, which should include specific time frames for receiving comments on all decisions. 4. Include weekly communication meetings as well as a central bulletin board for communication of key decision information.	
Software				
WECC includes a large variety of control areas and third parties that may be required to provide electricity generation data to WREGIS. All of these entities need to understand the need for and participate in defining a standard interface for supplying this important data.	.70	• Increased scope and schedule delays required to build and test interfaces to third parties who were not involved in the original requirements analysis.	1. Conduct a facilitated requirements gathering session with representative members of control area and third party organizations to identify and define standard electricity generation data interface requirements. 2. Adopt the approach proposed in the WREGIS Operational Rules Committee's *Interim Operating*	1. Identify those control areas expected to require data interfaces during the initial system implementation based on anticipated generator participation in WREGIS (e.g., those generators supporting California's IOUs). Introduce the system with data interfaces for these

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
			Rules that calls for establishing a master interface template to specify a standard interface and communication protocol. Based on the results of the requirements session, use this as the foundation of all Interface Control Documents (ICDs), and customize the master template within individual ICDs where needed to meet the specific needs of a particular control area or third party.	expected interfaces only and plan to add new interfaces with future releases. 2. Provide mechanisms for unanticipated control areas and third parties to provide electricity generation data via manual input during the initial system release. 3. Ensure that the schedule allows for additional time on tasks associated with system integration.
Additional requirements and refinement of previous requirements may emerge as a result of more detailed requirements analysis after the FSR is approved.	.50	• Increased scope and schedule delays due to major requirements added to original FSR requirements.	1. Communicate the FSR requirements package to all stakeholders and gain agreement that these high level requirements form the basis for costing the system. 2. Ensure that the change control process is implemented and understood by all stakeholders prior to project start. 3. Except for new requirements deemed essential to the system's success (per the change control process), create the system to meet the original FSR requirements and plan to implement new releases of the system to meet the additional	1. Except for new requirements deemed essential to the system's success, implement the system without the additional requirements.

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
			requirements.	
Logistics				
The State of California RFP procurement cycle requires many control agency reviews and approvals, making timely procurement difficult.	.90	• Schedule delays due to lengthy cycle times for control agency procurement reviews.	4. Meet with the Resources Agency, DOF, DGS, and LAO representatives prior to the delivery of the FSR and ITPP to ensure that these documents meet all the necessary requirements and are approved on the first review. 5. Work with DGS to ensure the schedule contains realistic timeframes for procurement activities. 6. Start the RFP procurement cycle as soon as possible. 7. Work with Energy Commission executives to streamline any internal review times as much as possible.	1. Delay the start of the system development schedule to accommodate procurement delay(s).
Organization				
Although WECC staff will be responsible for implementing and providing administrative support for WREGIS, they have not been involved in project planning. As the system becomes operational, WECC staff may have new perspectives on how WREGIS should work, resulting in changes in the system scope.	.90	• Schedule delays and added expense could result from scope changes late in the project life cycle.	1. Involve the WREGIS Program Development Project Manager in all planning, risk management, and quality control activities. 2. Ensure the WREGIS Program Development Project Manager participates in key design, requirements and other deliverables review, including the opportunity to work with a prototype version as soon as possible to facilitate WECC staff	1. Except for new requirements deemed essential to the system's success (per the change control process), implement the system without the additional requirements.

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
			buy-in and collect change requests (for processing via the established change control process). 3. Work with the WECC staff to develop WREGIS program administration and system user documentation as soon as possible to gain buy-in and assist in identifying potential problems early. 4. Establish an agreement with WECC staff to implement WREGIS as planned and to operate it for a period of time, collecting changes as required during initial operation.	
Because the specific roles and responsibilities of the WREGIS program and administrative operations staff housed at WECC and those of the WREGIS technical operations staff are yet to be defined, the procurement for the WREGIS technical operations staff will require extra work and consensus building with WECC.	.90	• Additional resources and schedule delays would be required to define, document, and gain consensus on the WREGIS technical operations staff and WREGIS Administrator roles and responsibilities before the procurement cycle can begin	1. Work with the WREGIS Governance Committee, the WREGIS Project Management team, and the WREGIS Change Control Board to clarify and define the roles and responsibilities of the WREGIS program and administrative operations staff at WECC and the minimum requirements for the WREGIS technical operations staff early in the work effort.	1. Delay issuing the RFP until the roles and responsibilities of the WREGIS program and administrative operations staff at WECC and those of the WREGIS technical operations staff are defined and approved by WECC, the WREGIS Project Management Team and the WREGIS Project Sponsor.
Other				
WREGIS operating fees are based on participation, which is voluntary for all participants. However, marketing WREGIS is seen as an	.70	• Expected income designated to fund WREGIS does not materialize as soon as planned.	1. Begin a marketing plan to communicate the benefits of the system to all clients at the outset of the system development	1. California continues to fund the shortfall. 2. Negotiate an increase in fees since there are fewer

Project Name: WREGIS Project Number:		Prepared by: Date: January 14, 2005		
Risk Category / Event	**Probability (%)**	**Affected Project Area/Element**	**Preventive Actions**	**Contingency Actions**
WREGIS is seen as an implementation activity. This may result in fewer initial market participants.		planned. • Decreased ability to account for renewable energy use • Unclear ownership rights to RECs	efforts. 2. Provide an incentive for early adopters of WREGIS.	fees since there are fewer users.
WREGIS is specifically envisioned to be policy-neutral. It is anticipated that WREGIS participants will meet many state-and policy-specific compliance requirements by voluntarily providing the required data. In addition, because some policies vary between regional agencies, in some instances regulatory agencies must "adjust" information provided in WREGIS reports to assess compliance (e.g., line loss). Unless WREGIS participants as well as state and provincial regulatory agencies understand how to use WREGIS to demonstrate/assess compliance, compliance activities will be difficult to perform.	.50	• Misunderstandings and miscommunications with participants could result if state and provincial regulatory agencies do not adequately communicate to WREGIS participants which fields must be supplied in order to demonstrate agency-specific compliance or if agencies fail to develop internal procedures for how to use the WREGIS reports to assess compliance. This would decrease the effectiveness and potentially the participation in the WREGIS program.	1. Conduct a facilitated requirements session specifically for state regulatory agencies to help ensure their requirements are included, to delineate roles and responsibilities for communicating agency-specific requirements to WREGIS participants, and to underscore the importance for developing agency-specific procedures for using WREGIS reports and data. 2. Conduct specific training sessions for state regulatory agencies early in the project to demonstrate how reports and data may be delivered.	1. Conduct as needed training and consulting for state/provincial regulatory agencies that have difficulties communicating WREGIS data requirements to participants or using WREGIS report to assess compliance.

Risk Management Definitions and Approach

The Risk Management Plan uses industry standard terminology and a proven standard approach as described in the following sections.

Definitions

- *Risk* is a potential event that would have a **negative impact** on the success of the project if the event were to occur.
- *Negative Impact* is the negative consequence of the risk materializing.
- *Risk Management* is the process of identifying and analyzing threats to the project's success, and the efforts to mitigate or eliminate negative impacts to the WREGIS project. Not all risks can be eliminated, but mitigation and contingency plans can be developed to lessen the impact if they occur.
- *Risk Identification* is used to determine which risks are likely to affect the project and document the characteristics of each. Risk identification is not a one-time event; it is performed on a regular basis throughout the project's lifecycle. Risk identification will address both internal and external risks.
- *Internal Risks* are those things the WREGIS Project Team can control or influence.
- *External Risks* are those things beyond the control or influence of the WREGIS Project Team.
- *Risk Analysis* is used to evaluate risks and risk interactions to assess the range of possible project outcomes and determine which risk events warrant response.
- *Risk Mitigation* identifies ways to minimize or eliminate project risks. Depending on the severity of the risk and the level of effort of the mitigation strategies, it may be appropriate to initiate several mitigation activities. In some cases, it may not always be possible to mitigate a risk.
- *Contingency Planning* is used for those risks where it is unlikely or uncertain that the mitigation will be effective. The contingency plan attempts to minimize the effects of the risk assuming the event does occur.
- *Risk Priority* is a determination of the importance of the risk based upon 1) potential impact of the risk on the project, 2) the probability of occurrence, and 3) the risk timeframe.
- *Risk Probability* is the likelihood of the occurrence of the risk (high, medium, low).
- *Risk Timeframe* is the period of time within which the risk is expected to occur (imminent, near-term, far-term).
- *Risk Tracking and Control* insures that all steps of the risk management process are being followed and, as a result, risks are being mitigated. Risk tracking and control involves the oversight and tracking of risk mitigation action plan execution, re-assessment of risks, reporting risk status, and recording risk information changes in the WREGIS Risk Log (for a

description of the items captured in the WREGIS Risk Log see Figure 4: WREGIS Risk Log Content).

Standards

The WREGIS Project risk management approach generally follows the SIMM guidelines as set forth in Section 200: Project Management Methodology (Release 1.0) dated January 1997, Subsection 3.10: Risk Management Plan.

The Risk Management Paradigm, depicted in Figure 1, summarizes the WREGIS risk management process. This paradigm is adapted for the WREGIS Project from the Software Engineering Institute (SEI) Risk Management Paradigm, introduced in *Software Development Risk: Opportunity, Not Problem, 1992* [3], and further described in *Software Acquisition Risk Management Key Process Area (KPA) – A Guidebook, 1997* [4]. The Risk Management Paradigm delineates the steps of the risk management process, which are:

Step 1 – Identify

Step 2 – Analyze

Step 3 – Plan

Step 4 – Implement

Step 5 – Track and Control

Communication is a key part of the Risk Management process and occurs at every step of the process among the WREGIS Project Team, stakeholders and vendor team.

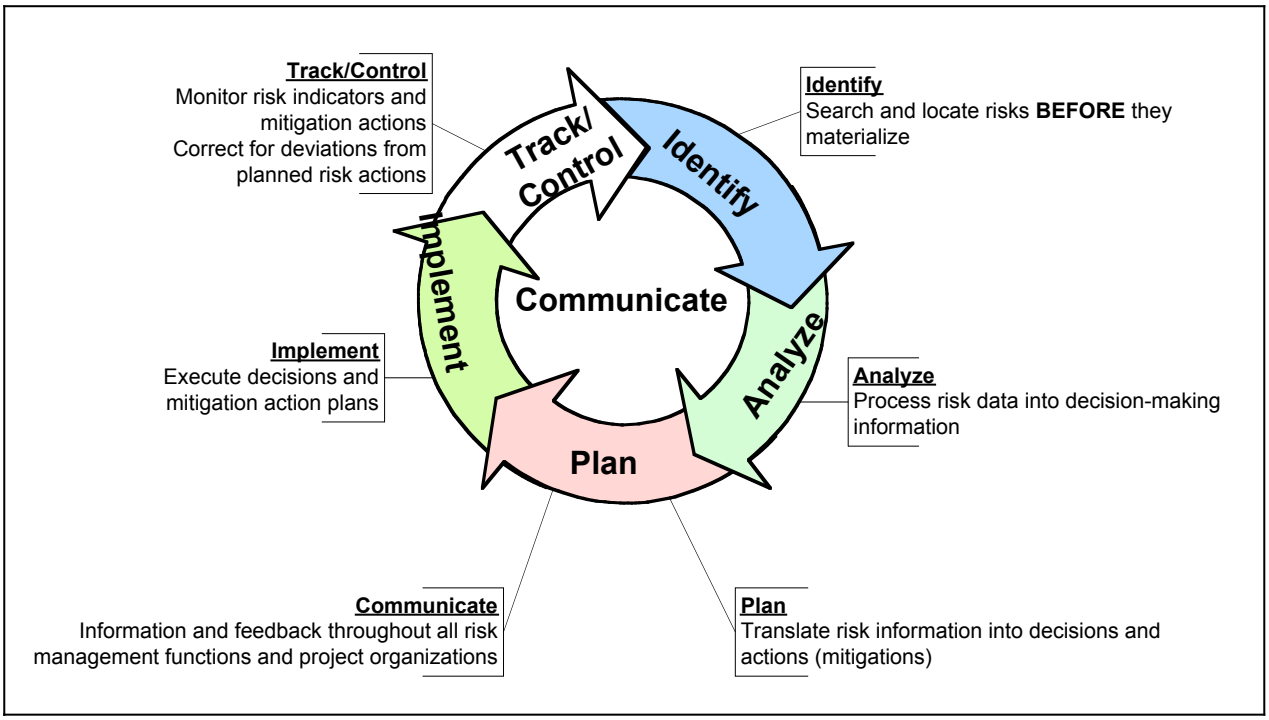


Figure 2: Project Risk Management Paradigm

Step 1. Identify

The first step to managing risks is to identify them. This step includes activities to research and find risks before they become problems. Risk identification transforms issues and concerns about a project into tangible risks, which can be described and measured. Risks can come from a variety of sources, both internal and external to the project. In researching potential risks, the WREGIS Project Team will consider internal and external factors and all areas of the project.

Risk identification will be an on-going task throughout the project lifecycle. Formal periodic risk identification and assessment meetings will be conducted as needed. A Risk Identification Form is used by the WREGIS Project Team to submit proposed risks for consideration, or to submit an update to an open risk.

A WREGIS Risk Log will be used to collect and report on identified risks.

Step 2. Analyze

Risk analysis is the process of analyzing and quantifying risks. It results in the classification and prioritization of identified risks, including a review and determination of whether an identified risk is acceptable. This process provides recommendations for mitigation and contingency strategies as well as identifying trigger conditions to monitor the potential occurrence of the risk. Risk analysis is not a one-time event; it will be performed on a regular basis throughout the life of the project. Each risk will be analyzed and prioritized to determine:

- Probability of its occurrence.

- Impacts and severity of the risk occurrence.
- Mitigation and contingency strategies.
- Trigger conditions for further action.

Some risks, e.g. political or legislative issues, may be beyond the control or mitigation of the Energy Commission and WECC. In such cases, the risk management strategy accepts the risk event and the potential consequences. Risk acceptance can be active (e.g., developing a contingency plan to be executed if the risk event occurs), or passive (e.g., taking no action, allowing the risk event to occur, and accepting the resulting consequences). The Risk Analysis process determines whether to use an active or a passive risk acceptance strategy for those risks whose mitigation is beyond the control of the Energy Commission and WECC.

Each risk will be assigned to a WREGIS Project Team Member to conduct and report back on their assessment. The WREGIS Technical Project Manager will ensure this analysis is completed and the WREGIS Risk Log is updated with the latest information.

Step 3. Plan

In Risk Planning, the team determines what actions need to be taken to manage the risks identified earlier. This step addresses two types of planning: Risk Mitigation Planning and Risk Contingency Planning.

Risk Mitigation Planning

Risk mitigation strategies identify ways to minimize or eliminate project risks. Mitigation strategies balance the probability and severity of the risk occurrence with the cost-effectiveness of the mitigation strategy and the likelihood of the desired effect. Depending on the severity of the risk and the level of effort of the mitigation strategies, a risk may have several mitigation activities.

Mitigation activities can be executed as soon as they are identified or upon the future occurrence of a trigger event. If the mitigation activities are not executed immediately, the person responsible for managing the risk identifies the trigger event or measurement, which will initiate the mitigation activity.

The following information will be documented in the Risk Mitigation Action Plan:

- The risk to be mitigated.
- Selected mitigation strategies to be implemented.
- When each mitigation activity will commence (trigger event).
- How and when (frequency of) the mitigation activities will be tracked.
- Who is responsible for the mitigation activities.
- Who is responsible for tracking mitigation effectiveness.

Risk Contingency Planning

For those risks where it is unlikely or uncertain that the mitigation will be effective, a contingency plan will be developed. The contingency plan helps to minimize the effects of the risk assuming the event does occur. A trigger mechanism will be identified that indicates when the contingency plan will be initiated. In some cases, the contingency plan may be initiated before the risk occurs in order to prepare for the occurrence.

For each risk, the Contingency Plan includes (but is not limited to):

- Description of the impending risk.
- Anticipated effects on project staff, users, and stakeholders.
- Anticipated effects on project schedule.
- Anticipated effects on project budget.
- Anticipated effects on work products or deliverables.
- Desired outcome of contingency activities.
- Communication strategy as risk becomes more likely.
- What activities will be executed to minimize risk's effects.
- Who is responsible for the activities.
- When will the activities occur (what is the trigger event).
- How to evaluate and track the effect of the contingency activities.
- When the contingency activities will cease (by a certain date or when a specific desired effect has occurred).

Step 4. Implement

In this step, the project team executes the actions identified and documented in the risk mitigation and/or the risk contingency plans. Contingency action plans are generally tied to a trigger event and executed upon that event occurring. Mitigation action plans may be implemented any time.

The WREGIS Risk Log is updated to reflect the actions taken.

Step 5. Track and Control

Risk tracking and control follows the progress of the risk event, its probability, and the associated trigger event as well as the status of any mitigation strategies that have been executed. By monitoring risk indicators and mitigation activities, plans can be adjusted or corrected to account for new information. When changes occur, the basic cycle of identify, analyze, plan, and implement is repeated.

The WREGIS Risk Log will be updated based on the status information received. Risk reports will be provided from the WREGIS Risk Log to the WREGIS Project Team and Project Sponsor.

The WREGIS Risk Management Plan will be updated as appropriate during the life of the project.

Risk Management Meetings

On a weekly basis, risk monitoring and mitigation activities are discussed between WREGIS Technical Project Manager and the WREGIS Project Team. Risk management is also discussed during project reviews with the Project Sponsor. When needed, special risk identification meetings are held with project staff and participants from WECC, in addition to subject-matter experts who may join these meetings from time to time.

Roles and Responsibilities

The following staff and stakeholders are involved in managing WREGIS project risks:

- *WREGIS Project Sponsor* is responsible for approval of the WREGIS Project RMP, participates in the risk management process, and takes ownership of risk mitigation and contingency planning and execution.
- *WREGIS Technical Project Manager* is responsible for leading the risk management effort, facilitates communication throughout the execution of the risk management process, ensures the WREGIS Risk Log is maintained, and the status assigned to the risk and risk activities is current.
- *WREGIS Program Lead and Project Team* participates in the risk identification process, and discusses risk monitoring and mitigation activities at team meetings.
- *Project Oversight Consultant and Quality Assurance Consultant* are responsible for ensuring identified risks are being managed in accordance with industry standards, identify new risks and/or propose mitigation strategies and contingency plans.
- *Risk Management Manager* is responsible for coordinating and tracking the identification, qualification, quantification, and mitigation planning activities of risks associated with the WREGIS Project. These tasks are ongoing throughout the life of WREGIS. This individual ensures that all appropriate risk information is captured WREGIS Risk Log and provides ongoing reporting to the WREGIS Project Sponsor, Program Lead, WREGIS Technical Project Manager, and key stakeholders, identify new risks and/or propose mitigation strategies and contingency plans.

The following matrix provides a more detailed breakout of the roles and responsibilities.

Figure 3: WREGIS Risk Management Roles and Responsibilities Matrix

Risk Management Process Steps	Responsibility	Detailed Process Steps
1. Identify	WREGIS Technical Project Manager	1.1 Identify Candidate Risks
	WREGIS Program Lead WREGIS Project Team Stakeholders Vendors	1.2 Provide Candidate Risk Input to WREGIS Technical PM
	WREGIS Technical Project Manager Risk Management Manager	1.3 Review and Process Candidate Risks
		1.4 Record Identified Risks in the WREGIS Risk Log
2. Analyze	WREGIS Technical Project Manager WREGIS Program Lead	2.1 Determine Risk Classification
		2.2 Determine Risk Impact
		2.3 Determine Risk Probability
		2.4 Determine Risk Timeframe
		2.5 Determine Risk Priority
		2.6 Develop Recommended Mitigation Strategies
		2.7 Develop Recommended Measurements
	Project Sponsor Project Oversight Consultant	2.8 Review Risk with the Project Team and Stakeholders
3. Plan	WREGIS Technical Project Manager WREGIS Program Lead WREGIS Project Team	3.1 Assign Risk Owner
		3.2 Finalize Mitigations
		3.3 Develop Measurements
	WREGIS Technical Project Manager WREGIS Program Lead Risk Management Manager Project Oversight Consultant Project Sponsor	3.4 Review Mitigations and Measurements
	Project Sponsor	3.5 Approve Mitigations and Measurements
	WREGIS Technical Project Manager Risk Management Manager	3.6 Develop Mitigation Action Plans
		3.7 Update WREGIS Risk Log

4. Implement	WREGIS Technical Project Manager Risk Management Manager	4.1 Execute Mitigation Action Plans
		4.2 Update WREGIS Risk Log
5. Track and Control	WREGIS Technical Project Manager Risk Management Manager Project Oversight Consultant	5.1 Monitor and Evaluate Mitigation Action Plan Execution
	WREGIS Technical Project Manager WREGIS Program Lead Risk Management Manager Project Oversight Consultant Project Sponsor	5.2 Track Action Plan Execution and Provide Feedback
	WREGIS Technical Project Manager WREGIS Program Lead Risk Management Manager Project Oversight Consultant	5.3 Monitor trigger events and initiate mitigation or contingency plans as required.
		5.4 Re-Assess Risks
		5.5 Report Risk Status
		5.6 Maintain WREGIS Risk Log

Figure 4: WREGIS Risk Log Content

Risk Log Item	Description	Phase Initially Entered
Risk ID	A unique identifier assigned to each risk item as it is entered into the WREGIS Risk Log used to track the risk item.	1. Identify
Originator	Name of the person who identified and submitted the risk item to the WREGIS Technical Project Manager, if available.	1. Identify
Originator Organization	Organization name of the person who identified and submitted the risk item to the WREGIS Technical Project Manager.	1. Identify
Origination Date	Date the risk item was either identified or submitted to the WREGIS Technical Project Manager, depending on the risk identification method used.	1. Identify
Risk Title	A brief (phrase or one sentence) description of the risk item that captures the key subject of the risk item or summarizes the risk statement.	1. Identify
Risk Statement	Concise description of the risk item. Capturing a statement of risk includes considering and recording the conditions that are causing concern of a possible loss to the project. A brief description of the perceived consequences resulting from the conditions is also included in the risk statement.	1. Identify
Risk Context/ Analysis	Detailed description of the risk item, including circumstances and supporting detail. Capturing the context of a risk involves recording information regarding the circumstances, events, and interrelationships within the project that supplements the risk statement. Context provides more detail than is presented by the risk statement.	1. Identify

Risk Log Item	Description	Phase Initially Entered
Status	The status of the risk at any point in time during the life cycle of the risk. A risk status of "1-Identifed" is assigned when the risk is first entered into the WREGIS Risk Log. 1-Identified – The risk item has been entered into the WREGIS Risk Log. 2-Confirmed – The risk item has been analyzed and validated through risk analysis. 3-Assigned – A Risk Owner has been assigned. 4-Approved – Risk Mitigations for the risk item have been approved. 5-Planned – Risk Mitigation Action Plans for the risk item have been developed. 6-Mitigated – Risk Mitigation Action Plans are being implemented. 7-Closed – The risk has been fully mitigated and no longer requires tracking. The Mitigation Status of all Risk Mitigations associated with the risk item has a Risk Mitigation Status of "Closed." A risk item which has been downgraded to a risk priority of "Low" may be determined to no longer require tracking, in which case the Risk Status will be changed to "Closed."	1. Identify
Status Change Date	Date of the last status change.	1. Identify
Risk Class	Category to which the risk item is assigned. This is an abstraction of the risk item that is determined by root cause analysis. There may be multiple risk classes identified for any individual risk item.	2. Analyze
Risk Impact	A description of the anticipated consequences of the risk materializing, expressed as: High, Medium, or Low	2. Analyze
Risk Probability	The likelihood of the occurrence of the risk, expressed as: High, Medium, or Low	2. Analyze
Risk Timeframe	The period of time within which the risk is expected to occur, expressed as: Imminent, Near-Term, or Far-Term	2. Analyze

Risk Log Item	Description	Phase Initially Entered
Risk Priority	A determination of the importance of the risk based upon 1) potential impact of the risk on the project and 2) the probability of occurrence, and 3) the risk timeframe, expressed as: 1-Critical 2-High 3-Medium 4-Low	2. Analyze
Recommended Mitigations	A description of the recommended response to the risk, designed to eliminate, reduce, or accept the risk, developed by the WREGIS Risk Analyst. (See also Risk Mitigations) There may be multiple recommended mitigations identified for any individual risk item.	2. Analyze
Recommended Measurements	Recommended methods used to track the risk and to measure the effectiveness of the recommended mitigations, developed by the WREGIS Risk Analyst. (See also Risk Measurements)	2. Analyze
Risk Owner	The person assigned responsibility for developing risk mitigations, measurements, and mitigation action plans, and implementing and tracking mitigation action plans.	3. Plan

Risk Log Item	Description	Phase Initially Entered
Risk Mitigations	A description of the response to the risk, designed to eliminate, reduce, or accept the risk, developed by the Risk Owner. • Elimination – remove the threat of the risk event occurring by eliminating the cause. • Reduction – reducing the priority of the risk by either reducing the impact on the project, the probability of occurrence, or both. • Acceptance – accepting the consequences of the risk event. Acceptance can be active (e.g., developing a contingency plan to be executed if the risk event occurs), or acceptance can be passive (e.g., taking no action, allowing the risk event to occur, and accepting the resulting consequences). There may be multiple mitigations identified for any individual risk item. Each mitigation action will be tracked separately. If Contingency Plans are developed in lieu of mitigations, a reference to the contingency plans will be provided.	3. Plan
Risk Measurements	Methods used to track the risk and to measure the effectiveness of the mitigations, developed by the Risk Owner. Measurements will be tracked for each Mitigation. If Contingency Plans are developed in lieu of mitigations, measurements will be focused on the effectiveness of the contingency plans.	3. Plan
Risk Mitigation Action Plan	The action plan developed to implement the mitigations. The contents of this item will be a reference to the detailed action plans.	3. Plan

Risk Log Item	Description	Phase Initially Entered
Risk Mitigation Status	The status of the risk mitigation, expressed as: 1-Approved – The Risk Mitigation for the risk item has been approved. 2-Planned – The Risk Mitigation Action Plan for the risk item has been developed. 3-Mitigated – The Risk Mitigation Action Plan is being implemented. 4-Closed – The Risk Mitigation has been fully implemented and no longer requires tracking. A risk item which has been downgraded to a risk priority of "Low" may be determined to no longer require tracking, in which case all associated Risk Mitigations will be closed.	3. Plan
Mitigation Progress	Textual description of the progress of the risk mitigation.	4. Implement
Comments	Text used for comments.	As applicable

8.1 Introduction to WREGIS Economic Analysis Worksheets

Introduction to Materials

Department: California Energy Commission Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

This spreadsheet contains the following "linked" worksheets:

Worksheet Name	Description
EXIS	This worksheet is intended to capture the costs associated with the existing or baseline system. Since there is technically no existing system and, based on conversations with DOF, it is not necessary to estimate the manual system (since it is not yet nor can it ever feasibly be) implemented to address the legislative mandates, no cost or resource data is supplied in this worksheet.
Commission Summary	This worksheet is a WREGIS-specific addendum to the standard DOF EAWs and was added to help present a summary of the projected costs for Energy Commission executive management review. This summary categories costs in a slightly different manner than does the EAW format; however, the costs all use the same basis and net to the same totals.
ALT(P)	This worksheet is intended to capture the cost and resources required to support the proposed solution alternative (build WREGIS based on modifying an existing, similar system). A line entitled "INCREASED REVENUES/OFF-SETS" reflects projected revenues that the institutional home (WECC) will accrue in collecting WREGIS usage fees and which will be used to off-set operating costs (reducing the costs to be covered by the Energy Commission).
ALT(1)	This worksheet is intended to capture the cost and resources required to support the alternative identified as being capable of meeting the WREGIS business objectives and requirements but not as well as the Proposed Solution (build WREGIS based on a new system). The primary difference between the resources and costs reflected in ALT(P) and this worksheet are two items: Contract Services/Software Customization costs in both the One-Time and Continuing Cost columns. (These costs are approximately 3x higher in this worksheet than they are in the ALT(P) worksheet.)
ALT(2)	This worksheet is intended to capture the cost and resources required to support an additional alternative; however, since no additional solution was assessed as being feasible, no cost or resource information is provided on this worksheet.
SUM3	This worksheet summarizes the data provided on the four previously described worksheet and provides an opportunity to provide the relative costs of the Proposed Solution and the other primary alternative.

8.1 Introduction to WREGIS Economic Analysis Worksheets

FUND-IT PROJ	This worksheet is intended to report the project funding plan for covering the costs associated with implementing and operating the information system. Since the Energy Commission intends to fund this project from the Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund, that account is reflected as "matching" the projected costs for each year. Because WREGIS usage fees collected by WECC are expected to off-set the continuing WREGIS operating expense and therefore lower the amount of funding the WREGIS program at WECC requires from the Energy Commission, these are shown as "Increased Revenues/Off-sets". The total funding needs for developing and operating WREGIS are reflected in this worksheet and in the FUND-PROGRAM worksheet that reports the program-related costs and funding needs.
FUND-PROGRAM	This worksheet is intended to report the project funding plan for covering the costs associated with developing and supporting the program that will provide the administrative operations and support for the WREGIS information system. As noted in several places within the FSR and these EAWS, a new program is required to support the WREGIS information system and to ensure the business objectives are met. Since the Energy Commission intends to fund this project from the Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund, that account is reflected as "matching" the projected costs for each year. Because WREGIS usage fees collected by WECC are expected to off-set the continuing WREGIS operating expense and therefore lower the amount of funding the WREGIS program at WECC requires from the Energy Commission, these are shown as "Increased Revenues/Off-sets". The total funding needs for developing and operating WREGIS are reflected in this worksheet and in the FUND-IT PROJ worksheet that reports the IT project-related costs and funding needs. [This worksheet is a WREGIS-specific addendum to the standard DOF EAWs.]
DETAIL "OTHER" COSTS	This worksheet is a WREGIS-specific addendum to the standard DOF EAWs and was added to help explain the costs currently included in the "Continuing Existing Program Costs/Other Program Costs" for post-implementation years, which are in large-part related to establishing and supporting the WREGIS program at WECC.

8.2 Energy Commission Summary of Costs

Energy Commission Summary of Costs

Department: California Energy Commission

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

Category of Expense	FY 2004/05	FY 2005/06	FY 2006/07	FY 2007/08	FY 2008/09	FY 2009/10
CEC Staff Salaries & Travel	$105,331	$254,795	$0	$0	$0	$0
Contract Services & Related Expenses						
System Development and Technical Operations Vendor (RFP)	$0	$995,000	$974,333	$642,667	$642,667	$642,667
IT Project Manager (RFO)	$0	$204,500	$0	$0	$0	$0
Program Development Project Manager (RFO)	$0	$204,500	$0	$0	$0	$0
Project Oversight Consultant (RFO)	$0	$54,000	$0	$0	$0	$0
QA Manager (RFO)	$0	$108,000	$0	$0	$0	$0
Configuration Management Consultant (RFO)	$0	$90,000	$0	$0	$0	$0
Subject Matter Consultants (Existing Contracts)	$213,125	$174,375	$0	$0	$0	$0
WREGIS Program at WECC						
Salaries & Travel	$10,000	$180,771	$332,342	$340,208	$349,635	$359,344
Program Development & Administrative Operations	$0	$150,500	$123,700	$118,250	$118,750	$119,250
Total	$328,456	$2,416,442	$1,430,375	$1,101,125	$1,111,051	$1,121,260

8.3 Existing System/Baseline

EXISTING SYSTEM/BASELINE COST WORKSHEET

Department: California Energy Commission | All costs to be shown in whole (unrounded) dollars. | Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

SEE NOTE BELOW	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
Continuing Information Technology Costs														
Staff (salaries & benefits)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Hardware Lease/Maintenance		0		0		0		0		0		0		**0**
Software Maintenance/Licenses		0		0		0		0		0		0		**0**
Contract Services		0		0		0		0		0		0		**0**
Data Center Services		0		0		0		0		0		0		**0**
Agency Facilities		0		0		0		0		0		0		**0**
Other		0		0		0		0		0		0		**0**
Total IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Continuing Program Costs:														
Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Other		0		0		0		0		0		0		**0**
Total Program Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
TOTAL EXISTING SYSTEM COSTS	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**

NOTE: The California Energy Commission is not currently using information technology in an automated way to track and verify RPS compliance. Also, there is currently no WREGIS Program, so program staff time used to date to attempt verification has been minimal due to the infeasible nature of verifying compliance manually.

8.4 Alternative: Proposed

PROPOSED ALTERNATIVE: Purchase and Modify Existing Tracking and Registry System

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
One-Time IT Project Costs														
Staff (Salaries & Benefits)[1]	1.3	105,331	3.0	252,795	0.0	0	0.0	0	0.0	0	0.0	0	4.3	358,127
Hardware Purchase		0		6,200		0		0		0		0		6,200
Software Purchase/License		0		2,000		0		0		0		0		2,000
Telecommunications		0		1,000		0		0		0		0		1,000
Contract Services														
Software Customization		0		995,000		331,667				0		0		1,326,667
Project Management		0		204,500		0		0		0		0		204,500
Project Oversight		0		54,000		0		0		0		0		54,000
IV&V Services		0		0		0		0		0		0		0
Other Contract Services		213,125		372,375		0		0		0		0		585,500
TOTAL Contract Services		213,125		1,625,875		331,667		0		0		0		2,170,667
Data Center Services		0		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0		0
Other[2]		0		0		0		0		0		0		10,000
Total One-time IT Costs	**1.3**	**318,456**	**3.0**	**1,887,870**	**0.0**	**331,667**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**4.3**	**2,537,993**
Continuing IT Project Costs														
Staff (Salaries & Benefits)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Hardware Lease/Maintenance		0		0		2,300		2,300		2,300		2,300		9,200
Software Maintenance/Licenses		0		0		1,000		1,000		1,000		1,000		4,000
Telecommunications		0		0		1,000		1,000		1,000		1,000		4,000
Contract Services		0		0		642,667		642,667		642,667		642,667		2,570,667
Data Center Services		0		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0		0
Other		0		0		0		0		0		0		0
Total Continuing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**2,587,867**
Total Project Costs	**1.3**	**318,456**	**3.0**	**1,887,870**	**0.0**	**978,633**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**4.3**	**5,125,860**
Continuing Existing Costs														
Information Technology Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other IT Costs		0		0		0		0		0		0		0
Total Continuing Existing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Program Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other Program Costs[2]		10,000		528,571		451,742		454,158		464,085		474,294		2,382,850

8.4 Alternative: Proposed

PROPOSED ALTERNATIVE: Purchase and Modify Existing Tracking and Registry System

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
Total Continuing Existing Program Co	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
Total Continuing Existing Costs	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
TOTAL ALTERNATIVE COSTS	**1.3**	**328,456**	**3.0**	**2,416,442**	**0.0**	**1,430,375**	**0.0**	**1,101,125**	**0.0**	**1,111,051**	**0.0**	**1,121,260**	**4.3**	**7,508,710**
INCREASED REVENUES/OFF-SETS[3]		0		0		837,700		1,005,240		1,206,288		1,447,546		**4,496,774**

NOTE: We have shown system maintenance and technical operations costs for each of four years of operation after the system is deployed as opposed to the more standard cost for one year post-implementation only. This is because these costs represent the bulk of the WREGIS program and system and are important to track for purposes of WREGIS becoming self-funded and CEC being able to discontinue its funding of the effort. The DOF OTROS analyst has indicated this approach makes sense to her as well.

Footnote[1]: These staff represent the PY equivalents and associated expense for the project positions described in the FSR: CEC WREGIS Program Lead (1 PY); CEC WREGIS Program Support (1 PY); CEC WREGIS Program Support Assistant (.5 PY); and CEC WREGIS REP Liaison and CEC WREGIS Risk Management Administration (at .25 PY each).

Footnote[2]: There is no existing WREGIS program nor associated staff. Staff retained to support the WREGIS program and administrative operations at WECC will not be State of California employees and so the expense associated with this is included in the "Other Program Costs" category and not in the Program staff category. For more detail on the program costs included in this category of expense, see the Detail "Other" Costs Worksheet included in this package.

Footnote[3]: The WREGIS program at WECC will collect usage fees that will be used to offset operating expenses and thus lower the funding required from the Energy Commission. No agreement has been reached yet on the fee structure and it is unclear when the fee structure will be finalized. Until the fee structure has been established and implemented, the CEC will fully fund WREGIS costs. After the fee structure is implemented, CEC will cover any shortfall between fees collected and total WREGIS operating expense. Refer to FSR section 5.2.23 for additional detail.

8.5 Alternative: One

ALTERNATIVE #1: Build New Tracking and Registry System

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
One-Time IT Project Costs														
Staff (Salaries & Benefits)[1]	1.3	105,331	3.0	252,795	0.0	0	0.0	0	0.0	0	0.0	0	4.3	358,127
Hardware Purchase		0		6,200		0		0		0		0		6,200
Software Purchase/License		0		2,000		0		0		0		0		2,000
Telecommunications		0		1,000		0		0		0		0		1,000
Contract Services														
Software Customization		0		2,795,000		931,667		0		0		0		3,726,667
Project Management		0		204,500		0		0		0		0		204,500
Project Oversight		0		54,000		0		0		0		0		54,000
IV&V Services		0		0		0		0		0		0		0
Other Contract Services		213,125		372,375		0		0		0		0		585,500
TOTAL Contract Services		213,125		3,425,875		931,667		0		0		0		4,570,667
Data Center Services		0		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0		0
Other		0		0		0		0		0		0		10,000
Total One-time IT Costs	**1.3**	**318,456**	**3.0**	**3,687,870**	**0.0**	**931,667**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**4.3**	**4,937,993**
Continuing IT Project Costs														
Staff (Salaries & Benefits)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Hardware Lease/Maintenance		0		0		2,300		2,300		2,300		2,300		9,200
Software Maintenance/Licenses		0		0		1,000		1,000		1,000		1,000		4,000
Telecommunications		0		0		1,000		1,000		1,000		1,000		4,000
Contract Services		0		0		1,002,667		1,002,667		1,002,667		1,002,667		4,010,667
Data Center Services		0		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0		0
Other		0		0		0		0		0		0		0
Total Continuing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**1,006,967**	**0.0**	**1,006,967**	**0.0**	**1,006,967**	**0.0**	**1,006,967**	**0.0**	**4,027,867**
Total Project Costs	**1.3**	**318,456**	**3.0**	**3,687,870**	**0.0**	**1,938,633**	**0.0**	**1,006,967**	**0.0**	**1,006,967**	**0.0**	**1,006,967**	**4.3**	**8,965,860**
Continuing Existing Costs														
Information Technology Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other IT Costs		0		0		0		0		0		0		0
Total Continuing Existing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Program Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other Program Costs[2]		10,000		528,571		451,742		454,158		464,085		474,294		2,382,850
Total Continuing Existing Program Costs	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
Total Continuing Existing Costs	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
TOTAL ALTERNATIVE COSTS	**1.3**	**328,456**	**3.0**	**4,216,442**	**0.0**	**2,390,375**	**0.0**	**1,461,125**	**0.0**	**1,471,051**	**0.0**	**1,481,260**	**4.3**	**11,348,710**
INCREASED REVENUES/OFF-SETS[3]		0		0		837,700		1,005,240		1,206,288		1,447,546		**4,496,774**

8.5 Alternative: One

ALTERNATIVE #1: Build New Tracking and Registry System

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts

NOTE: We have shown system maintenance and technical operations costs for each of four years of operation after the system is deployed as opposed to the more standard cost for one year post-implementation only. This is because these costs represent the bulk of the WREGIS program and system and are important to track for purposes of WREGIS becoming self-funded and CEC being able to discontinue its funding of the effort. The DOF OTROS analyst has indicated this approach makes sense to her as well.

Footnote[1]: These staff represent the PY equivalents and associated expense for the project positions described in the FSR: CEC WREGIS Program Lead (1 PY); CEC WREGIS Program Support (1 PY); CEC WREGIS Program Support Assistant (.5 PY); and CEC WREGIS REP Liaison and CEC WREGIS Risk Management Administration (at .25 PY each).

Footnote[2]: There is no existing WREGIS program nor associated staff. Staff retained to support the WREGIS program and administrative operations at WECC will not be State of California employees and so the expense associated with this is included in the "Other Program Costs" category and not in the Program staff category. For more detail on the program costs included in this category of expense, see the Detail "Other" Costs Worksheet included in this package.

Footnote[3]: The WREGIS program at WECC will collect usage fees that will be used to offset operating expenses and thus lower the funding required from the Energy Commission. No agreement has been reached yet on the fee structure and it is unclear when the fee structure will be finalized. Until the fee structure has been established and implemented, the CEC will fully fund WREGIS costs. After the fee structure is implemented, CEC will cover any shortfall between fees collected and total WREGIS operating expense. Refer to FSR section 5.2.23 for additional detail.

8.6 Alternative: Two

ALTERNATIVE #2: _____

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
One-Time IT Project Costs												
Staff (Salaries & Benefits)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Hardware Purchase		0		0		0		0		0		0
Software Purchase/License		0		0		0		0		0		0
Telecommunications		0		0		0		0		0		0
Contract Services												
Software Customization		0		0		0		0		0		0
Project Management		0		0		0		0		0		0
Project Oversight		0		0		0		0		0		0
IV&V Services		0		0		0		0		0		0
Other Contract Services		0		0		0		0		0		0
TOTAL Contract Services		0		0		0		0		0		0
Data Center Services		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0
Other		0		0		0		0		0		0
Total One-time IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Continuing IT Project Costs												
Staff (Salaries & Benefits)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Hardware Lease/Maintenance		0		0		0		0		0		0
Software Maintenance/Licenses		0		0		0		0		0		0
Telecommunications		0		0		0		0		0		0
Contract Services		0		0		0		0		0		0
Data Center Services		0		0		0		0		0		0
Agency Facilities		0		0		0		0		0		0
Other		0		0		0		0		0		0
Total Continuing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Total Project Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Continuing Existing Costs												
Information Technology Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other IT Costs		0		0		0		0		0		0
Total Continuing Existing IT Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**

8.6 Alternative: Two

ALTERNATIVE #2: _____

Date Prepared: 2/24/05

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		TOTAL	
	PYs	**Amts**	**PYs**	**Amts**	**PYs**	**Amts**	**PYs**	**Amts**	**PYs**	**Amts**	**PYs**	**Amts**
Program Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Other Program Costs		0		0		0		0		0		0
Total Continuing Existing Program Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
Total Continuing Existing Costs	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
TOTAL ALTERNATIVE COSTS	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**
INCREASED REVENUES		0		0		0		0		0		**0**

8.7 Economic Analysis Summary

ECONOMIC ANALYSIS SUMMARY

Date Prepared: 2/24/05

Department: California Energy Commission

All costs to be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
EXISTING SYSTEM														
Total IT Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Total Program Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Total Existing System Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
PROPOSED ALTERNATIVE	**Purchase and Modify Existing Tracking and Registry System**													
Total Project Costs	1.3	318,456	3.0	1,887,870	0.0	978,633	0.0	646,967	0.0	646,967	0.0	646,967	4.3	5,125,860
Total Cont. Exist. Costs	0.0	10,000	0.0	528,571	0.0	451,742	0.0	454,158	0.0	464,085	0.0	474,294	0.0	2,382,850
Total Alternative Costs	1.3	328,456	3.0	2,416,442	0.0	1,430,375	0.0	1,101,125	0.0	1,111,051	0.0	1,121,260	4.3	7,508,710
COST SAVINGS/AVOIDANCES	(1.3)	(328,456)	(3.0)	(2,416,442)	0.0	(1,430,375)	0.0	(1,101,125)	0.0	(1,111,051)	0.0	(1,121,260)	(4.3)	(7,508,710)
Increased Revenues		0		0		837,700		1,005,240		1,206,288		1,447,546		4,496,774
Net (Cost) or Benefit	(1.3)	(328,456)	(3.0)	(2,416,442)	0.0	(592,675)	0.0	(95,885)	0.0	95,237	0.0	326,285	(4.3)	(3,011,936)
Cum. Net (Cost) or Benefit	(1.3)	(328,456)	(4.3)	(2,744,898)	(4.3)	(3,337,573)	(4.3)	(3,433,458)	(4.3)	(3,338,222)	(4.3)	(3,011,936)		
ALTERNATIVE #1	**Build New Tracking and Registry System**													
Total Project Costs	1.3	318,456	3.0	3,687,870	0.0	1,938,633	0.0	1,006,967	0.0	1,006,967	0.0	1,006,967	4.3	8,965,860
Total Cont. Exist. Costs	0.0	10,000	0.0	528,571	0.0	451,742	0.0	454,158	0.0	464,085	0.0	474,294	0.0	2,382,850
Total Alternative Costs	1.3	328,456	3.0	4,216,442	0.0	2,390,375	0.0	1,461,125	0.0	1,471,051	0.0	1,481,260	4.3	11,348,710
COST SAVINGS/AVOIDANCES	(1.3)	(328,456)	(3.0)	(4,216,442)	0.0	(2,390,375)	0.0	(1,461,125)	0.0	(1,471,051)	0.0	(1,481,260)	(4.3)	(11,348,710)
Increased Revenues		0		0		837,700		1,005,240		1,206,288		1,447,546		4,496,774
Net (Cost) or Benefit	(1.3)	(328,456)	(3.0)	(4,216,442)	0.0	(1,552,675)	0.0	(455,885)	0.0	(264,763)	0.0	(33,715)	(4.3)	(6,851,936)
Cum. Net (Cost) or Benefit	(1.3)	(328,456)	(4.3)	(4,544,898)	(4.3)	(6,097,573)	(4.3)	(6,553,458)	(4.3)	(6,818,222)	(4.3)	(6,851,936)		
ALTERNATIVE #2														
Total Project Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Total Cont. Exist. Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Total Alternative Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
COST SAVINGS/AVOIDANCES	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Increased Revenues		0		0		0		0		0		0		0
Net (Cost) or Benefit	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Cum. Net (Cost) or Benefit	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		

8.8 Project Funding Plan (IT)

PROJECT FUNDING PLAN (IT)

Department: California Energy Commission | All Costs to be in whole (unrounded) dollars | Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
TOTAL IT PROJECT COSTS	**1.3**	**318,456**	**3.0**	**1,887,870**	**0.0**	**978,633**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**4.3**	**5,125,860**
RESOURCES TO BE REDIRECTED														
Staff	1.3	105,331	3.0	252,795	0.0	0	0.0	0	0.0	0	0.0	0	**4.3**	**358,127**
Funds:														
Existing System		0		0		0		0		0		0		**0**
Other Fund Sources[1]		213,125		1,635,075		978,633		646,967		646,967		646,967		**4,767,733**
TOTAL REDIRECTED RESOURCES	**1.3**	**318,456**	**3.0**	**1,887,870**	**0.0**	**978,633**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**4.3**	**5,125,860**
ADDITIONAL PROJECT FUNDING NEEDED														
One-Time Project Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Continuing Project Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
TOTAL ADDITIONAL PROJECT FUNDS NEEDED BY FISCAL YEAR	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	0.0	0	**0.0**	**0**
TOTAL PROJECT FUNDING	**1.3**	**318,456**	**3.0**	**1,887,870**	**0.0**	**978,633**	**0.0**	**646,967**	**0.0**	**646,967**	**0.0**	**646,967**	**4.3**	**5,125,860**
Difference: Funding - Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Total Estimated Cost Savings	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**

Footnote[1]: Funding source is the *Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund* . The Energy Commission is authorized to apply the dollars allocated in this fund to pay for the cost of developing and supporting WREGIS. As a consequence, no new monies are requested to fund this project.

8.8 Project Funding Plan (IT)

PROJECT FUNDING PLAN (IT)

Department: California Energy Commission | All Costs to be in whole (unrounded) dollars | Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts

ADJUSTMENTS, SAVINGS AND REVENUES WORKSHEET (DOF Use Only)

Department: California Energy Commission | Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

Annual Project Adjustments	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		Net Adjustments	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
One-time Costs														
Previous Year's Baseline	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
(A) Annual Augmentation /(Reduction)	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		
(B) Total One-Time Budget Actions	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Continuing Costs														
Previous Year's Baseline	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
(C) Annual Augmentation /(Reduction)	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		
(D) Total Continuing Budget Actions	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Total Annual Project Budget Augmentation /(Reduction) [A + C]	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		

[A, C] Excludes Redirected Resources

Total Additional Project Funds Needed [B + D]	**0.0**	**0**

Annual Savings/Revenue Adjustments

8.8 Project Funding Plan (IT)

PROJECT FUNDING PLAN (IT)

Department: California Energy Commission

All Costs to be in whole (unrounded) dollars

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
Cost Savings	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
Increased Program Revenues/Off-sets[2]		0		0		837,700		1,005,240		1,206,288		1,447,546		

Footnote[2]: The WREGIS program at WECC will collect usage fees that will be used to offset operating expenses and thus lower the funding required from the Energy Commission. No agreement has been reached yet on the fee structure and it is unclear when the fee structure will be finalized. Until the fee structure has been established and implemented, the CEC will fully fund WREGIS costs. After the fee structure is implemented, CEC will cover any shortfall between fees collected and total WREGIS operating expense. Refer to FSR section 5.2.23 for additional detail. Total operating expense includes both the IT costs (reflected in the IT Project Funding Plan) and the program-related costs (reflected in the Program Project Funding Plan). Refer to FSR section 5.2.23 for additional detail.

8.9 Project Funding Plan (Program)

PROJECT FUNDING PLAN (PROGRAM)[1]

Department: California Energy Commission

All Costs to be in whole (unrounded) dollars

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
TOTAL PROJECT PROGRAM COSTS[1]	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
RESOURCES TO BE REDIRECTED														
Staff	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Funds:														
Existing System		0		0		0		0		0		0		**0**
Other Fund Sources[2]		10,000		528,571		451,742		454,158		464,085		474,294		**2,382,850**
TOTAL REDIRECTED RESOURCES	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
ADDITIONAL PROJECT PROGRAM FUNDING NEEDED														
One-Time Project Program Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Continuing Project Program Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
TOTAL ADDITIONAL PROJECT PROGRAM FUNDS NEEDED BY FISCAL YEAR	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	0.0	0	**0.0**	**0**
TOTAL PROJECT PROGRAM FUNDING	**0.0**	**10,000**	**0.0**	**528,571**	**0.0**	**451,742**	**0.0**	**454,158**	**0.0**	**464,085**	**0.0**	**474,294**	**0.0**	**2,382,850**
Difference: Funding - Costs	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**

Total Estimated Cost Savings	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**

Footnote[1]: This worksheet is added to reflect costs and funding requirements associated with developing and supporting the program that administers the IT system after the system is implemented (the IT costs and funding requirements are shown on the PROJECT FUNDING (IT) worksheet). In discussions with DOF OTROS analyst, it has been acknowledged that this is an unusual project in that the work effort to implement, deploy and support the IT system also requires that a new program be developed & supported to administer that system. That program will reside outside the state of CA. The CEC is contracting with WECC to host his program, including hiring staff and covering costs for program development, etc. Due the essential coupling of the IT development and the new program needed to support it, the costs of the new program must also be "funded" as part of this FSR. At the DOF OTROS analyst's suggestion, we have reported the program-related costs both during and after the system is implemented in the "Total Continuing Existing Costs/Other Program Costs" on the Alternative worksheets (although technically there is no existing program) andincluded this additional funding worksheet to show the program-related costs to ensure these are reflected in the total project costs (representing $2,382,850).

8.9 Project Funding Plan (Program)

PROJECT FUNDING PLAN (PROGRAM)[1]

Department: California Energy Commission

All Costs to be in whole (unrounded) dollars

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts

Footnote[2]: Funding source is the *Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund.* The Energy Commission is authorized to apply the dollars allocated in this fund to pay for the cost of developing and supporting WREGIS. As a consequence, no new monies are requested to fund this project.

ADJUSTMENTS, SAVINGS AND REVENUES WORKSHEET (DOF Use Only)

Department: California Energy Commission

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

Annual Project Adjustments	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		Net Adjustments	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
One-time Costs														
Previous Year's Baseline	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
(A) Annual Augmentation /(Reduction)	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		
(B) Total One-Time Budget Actions	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Continuing Costs														
Previous Year's Baseline	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
(C) Annual Augmentation /(Reduction)	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		
(D) Total Continuing Budget Actions	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	**0.0**	**0**
Total Annual Project Budget Augmentation /(Reduction) [A + C]	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**		

8.9 Project Funding Plan (Program)

PROJECT FUNDING PLAN (PROGRAM)[1]

Department: California Energy Commission

All Costs to be in whole (unrounded) dollars

Date Prepared: 2/24/05

Project: Western Renewable Energy Information System (WREGIS)

	FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTALS	
	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts

[A, C] Excludes Redirected Resources

Total Additional Project Funds Needed [B + D]	**0.0**	**0**

Annual Savings/Revenue Adjustments

Cost Savings	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0		
Increased Program Revenues/Off-sets[2]		0		0		837,700		1,005,240		1,206,288		1,447,546		

Footnote[2]: The WREGIS program at WECC will collect usage fees that will be used to offset operating expenses and thus lower the funding required from the Energy Commission. No agreement has been reached yet on the fee structure and it is unclear when the fee structure will be finalized. Until the fee structure has been established and implemented, the CEC will fully fund WREGIS costs. After the fee structure is implemented, CEC will cover any shortfall between fees collected and total WREGIS operating expense. Refer to FSR section 5.2.23 for additional detail. Total operating expense includes both the IT costs (reflected in the IT Project Funding Plan) and the program-related costs (reflected in the Program Project Funding Plan). Refer to FSR section 5.2.23 for additional detail.

8.10 Detail Other

ADDENDUM

ROPOSED ALTERNATIVE: Purchase and Modify Existing Tracking and Registry System
and Build New Tracking and Registry System

Date Prepared: 2/24/05

Note: The below details the costs included in the "Continuing Existing Program Costs/Other Program Costs" line items in both the Proposed and Alternative Solution
Please see note at the bottom of this sheet concerning the costs reflected here.

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

			FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
			PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
Included in the "Continuing Existing Program Costs/Other Program Costs" line items in the Alternatives worksheets.																
Other[1]	Detail Cost Item	Brief Description														
	Contract-Project Staff for the Program: Program Development Project Manager	Project Manager to support the program development efforts on the project during the Development Year	N/A	$0	N/A	$204,500										
	Program Staff: WECC WREGIS Administrator	Staffing for a WECC-located program (not California). Continuing costs assume 3% cost of living increase annually.	0	$0	1	$150,771	2	$304,342	2	$314,208	2	$323,635	2	$333,344	**2**	**$1,426,300**
	Travel: WREGIS Program Lead	Allows two trips to WECC in Salt Lake City, UT at estimated $1000 per trip (inclusive of travel and lodging)	N/A	0	N/A	$2,000	N/A	$0	N/A	$0		$0	N/A	$0	**N/A**	**$2,000**
	Travel: WREGIS Administrator[1]	Allows 10 trips for Development Year and then 8 trips each year post-implementation at estimated $1000 cost per trip (inclusive of travel and lodging).	N/A	$0	N/A	$10,000	N/A	$8,000	N/A	$8,000	N/A	$8,000	N/A	$8,000	**N/A**	**$42,000**
	Travel: WREGIS (Governance) Committee[2]	Travel for governance board at WECC (for project and continuing governance of program)	N/A	$10,000	N/A	$20,000	N/A	$20,000	N/A	$18,000	N/A	$18,000	N/A	$18,000	**N/A**	**$104,000**

8.10 Detail Other

ADDENDUM

ROPOSED ALTERNATIVE: Purchase and Modify Existing Tracking and Registry System
and Build New Tracking and Registry System

Date Prepared: 2/24/05

Note: The below details the costs included in the "Continuing Existing Program Costs/Other Program Costs" line items in both the Proposed and Alternative Solution
Please see note at the bottom of this sheet concerning the costs reflected here.

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

			FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
			PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts
	Program development and marketing costs	Costs for developing and marketing the program throughout the region (key factor in success).	N/A	$0	N/A	$75,000	N/A	$50,000	N/A	$50,000	N/A	$50,000	N/A	$50,000	**N/A**	**$275,000**
	Office furniture, phones, computer repairs, computer maintenance (external technical support), and conference call costs	Reimburse WECC estimated costs for establishing and maintaining WREGIS staff's work environment other than computers, printers, and telecommunications (these latter costs reflected in One-Time and Continuing Project Costs on the EAWs).	N/A	$0	N/A	9,400	N/A	8,000	N/A	7,050	N/A	7,050	N/A	7,050	**N/A**	**$38,550**
	WECC Accounting/Admin support	Reimburse WECC for services provided to WREGIS program located at WECC. Slight increase over time as WREGIS participants increase and increased volume of accounting support anticipated.	N/A	$0	N/A	$56,900	N/A	$61,400	N/A	$56,900	N/A	$57,400	N/A	$57,900	**N/A**	**$290,500**
		Subtotal "Other"	N/A	$10,000	N/A	$528,571	N/A	$451,742	N/A	$454,158		$464,085	N/A	$474,294	2	**$2,382,850**

NOTE1: The WREGIS Program and Information System are different from the projects standardly defined using the state of California EAWs. The WREGIS program is a new program that will reside outside the state of California, as will the continuing operations of the WREGIS Information System. Because the program costs do not correspond to any existing program nor any program within any California department, the FSR team was unclear on where the program-related costs should be reported. Based on feedback from the DOF OTROS analyst, these costs have been included in the "Continuing Existing Costs/Other Program Costs" line item for during the project and post-implementation. This worksheet has been added to further explain the nature of those costs.

8.10 Detail Other

ADDENDUM

ROPOSED ALTERNATIVE: Purchase and Modify Existing Tracking and Registry System
and Build New Tracking and Registry System

Date Prepared: 2/24/05

Note: The below details the costs included in the "Continuing Existing Program Costs/Other Program Costs" line items in both the Proposed and Alternative Solution
Please see note at the bottom of this sheet concerning the costs reflected here.

Department: California Energy Commission

All Costs Should be shown in whole (unrounded) dollars.

Project: Western Renewable Energy Information System (WREGIS)

FY 2004/05		FY 2005/06		FY 2006/07		FY 2007/08		FY 2008/09		FY 2009/10		TOTAL	
PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts	PYs	Amts

NOTE2: Information on reconciling this worksheet to the Commission Summary worksheet. This worksheet includes two line items for costs in the Development Year that are not reflected in the "WREGIS Program at WECC" portion of the Commission Summary sheet. The $2,000 for the CEC WREGIS Program Lead travel is included under "CEC Staff Salaries and Travel" in the Commission Summary worksheet . This worksheet also includes the costs associated with the Program Development Project Manager during the Development Year. This cost is reported under the "Contract Services & Related Expenses" portion of the Commission Summary." In addition, the "WREGIS Program at WECC/Program Development & Administrative Operations" section within the Commission Summary worksheet includes costs for all years for hardware, desktop software and telecommunications for the WREGIS staff working at WECC. Those costs are not included in this worksheet because they are reported under specific line items under One-Time and Continuing IT Costs on the Alternatives Spreadsheets (and not under the "Continuing Existing Program Costs/Other Program Costs" line item explained in this worksheet).

Footnote[1]: Anticipate the WREGIS Administrator will need to travel to one or more control areas (or locations where multiple control areas might be represented) as well as to other locations to begin to develop relationship with those control areas that will be among the earliest interfaces to WREGIS and to develop/solicit overall participant interest in WREGIS (e.g., might go to trade shows, conferences, etc.) Although elements of this might be ongoing, it would be greatest during first few years.

Footnote[2]: Board participants are reimbursed for direct expenses. Assuming there will be a maximum of 10 board members. Assuming 3 meetings during the Development Year and 2 meetings the following year and 2 meetings each of the ensuing years (with some reduction in physical attendance). Estimate travel/lodging expense at $1000/person per meeting.

9. Appendix

9.1 Glossary of Terms

Word or Phrase	Definition
AB	Assembly Bill
Aggregator	An entity responsible for planning, scheduling, accounting, billing, and settlement for energy deliveries for portfolios of sellers and/or buyers.
Annual procurement target	The quantity of eligible renewable resources that a retail seller must procure within a particular year to reach California's RPS target of 20 percent of its retail sales procured from eligible energy resources no later than December 31, 2017.
APT	Annual Procurement Target
Attribute	Descriptive or performance characteristic of a particular generation resource. Some of the attributes of interest in the renewable energy market include physical attributes (e.g., size and location of the generating unit, fuel type used to generate the electricity), environmental attributes (e.g., emission offsets or avoidance), and economic attributes (e.g., labor union status of generating unit).
Baseline	For California's RPS, refers to the quantity of eligible renewable resources procured in 2001. For the baseline, "procurement" includes power sold to an investor owned utilities' customers by the Department of Water Resources and power from a facility owned or contracted for by the investor owned utility, pursuant to SB 1078 Section 399.15 (a) (3).
California Energy Commission RPS Identifier	Certified Renewable Suppler identification number assigned to a generating facility by the California Energy Commission under the certification process described in (California) Renewables Portfolio Standard Eligibility Guidebook (publication number 500-04-002D).
California Public Utilities Commission	A state commission regulating privately owned electric, telecommunications, natural gas, water and transportation companies, in addition to household goods movers and rail safety. SB 1078 requires that the Energy Commission and the California Public Utilities Commission (CPUC) work collaboratively to implement the RPS and assigns specific roles to each agency.
CCA	Community Choice Aggregators
CEC RPS ID	California Energy Commission Renewable Portfolio Standard Identifier
Community Choice Aggregators	As defined in California Assembly Bill (AB 117, Migden, Chapter 838, Statutes of 2001-2002) refers to any of the following entities, if that entity is not within the jurisdiction of a local publicly owned electric utility that provided electrical service as of January 1, 2003: any city, county, or city and county whose governing board

Word or Phrase	Definition
	elects to combine the loads of its residents, businesses, and municipal facilities in a community-wide electricity buyers program or any group of cities, counties, or cities and counties whose governing boards have elected to combine the loads of their programs, through the formation of a joint powers agency established under Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code.
Contract-path Accounting System	Refers to an accounting methodology whereby individual contracts and financial settlement data are used to verify renewable purchases. Such a system usually involves some sort of manual review of contracts and receipts, although the data may be maintained in a database or other electronic format. This is the method used to verify RPS compliance for 2003 and 2004.
Control Area	An electric power system, or a combination of electric power systems, to which a common automatic generation control (AGC) is applied to match the power output of generating units within the area to demand. To operate the systems safely and reliably, and to provide dependable electric service to their customers, the North American interconnections (see "Grid") are divided into 152 regional "control areas" that monitor and control a regional transmission grid. Control areas are the primary units responsible for the reliable operation of the transmission system. The Eastern Interconnection has 109 control areas, the Western has 33, and Texas has 10. For purposes of establishing the WREIGS requirements, the following more inclusive definition of a control area is used: "An electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation of the Interconnection … a Control Area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A Control Area operator may be a system operator, a transmission grid operator, or a utility."
Conventional power source	California Public Utilities code Section 2805 defines a "conventional power source" as power derived from nuclear energy, or the operation of a hydropower facility greater than 30 megawatts, or the combustion of fossil fuels with the exception of cogeneration.
CPUC	California Public Utilities Commission. Also referred to as the Public Utilities Commission (PUC).
Data Interface Sub-Committee	The Data Interface Sub-Committee is a WREGIS Working Group subcommittee responsible for specifying how renewable electricity generation data will be collected, verified, and included in WREGIS from different sources in the Western Interconnection.

Word or Phrase	Definition
	This Committee will also be tasked to determine the level of accuracy of generation data, the standard of uniformity of generation data, and the protocols for accessing the data for inclusion in WREGIS.
Disaggregation	From the perspective of WREGIS, this is defined as separately selling some attribute or aspect of the WREGIS certificate to another party.
DISC	Data Interface Sub-Committee
Distributed Generation	Electricity generation originating from a wide range of technologies, some of which are renewable, such as solar photovoltaic. Distributed generation systems, as contrasted to large utility power plants, typically range from less than a kilowatt (kW) to megawatts (MW) in size. These distributed technologies can be used for on-site renewable generation.
DOF	State of California Department of Finance
EATS	Environmental Protection Agency's Emissions and Allowance Tracking System.
EAW	Economic Analysis Worksheet
EIA	Energy Information Administration
Electrical corporations	Within California, refers to Pacific Gas and Electric Company, San Diego Gas and Electric Company, Southern California Edison Company, or other electrical corporations as defined by Public Utilities Code section 213, contributing funds to the Renewable Resources Consumer Education Account of the Renewable Resource Trust Fund pursuant to Public Utilities Code section 399. Also referred to as "investor-owned utilities."
Electronic Accounting System	Refers to a system whereby financial settlements data are automatically entered into an electronic system, eliminating or minimizing the need to do manual review of contracts or receipts. An electronic accounting system is based on creating renewable certificates for each increment of electricity generated. WREGIS will be an electronic accounting system.
Electric Service Provider	An entity such as a marketer or an aggregator who provides electricity directly to an end-use customer in the direct access market.
Electric Reliability Council of Texas	The organization that administers the State of Texas power grid under the primary regulatory authority of the Public Utility Commission of Texas. This is also the organization that administers the renewable energy generation and tracking system used within Texas.
Emissions and Allowance Tracking System	Environmental Protection Agency's system designed to allow generators throughout the United States to report emissions and create, track and trade emission allowances. Emission allowance tracking and registries include some functionality that is similar to renewable generation tracking and registry systems.

Word or Phrase	Definition
End-use customer (end-user)	A residential, commercial, agricultural, or industrial electric customer who buys electricity to be consumed as a final product (not for resale).
Energy Information Administration	A statistical agency of the U.S. Department of Energy providing policy-independent data, forecasts, and analyses.
ERCOT	Electrical Reliability Council of Texas
ESP	Electric Service Provider
Financial settlements data	Data used to make payments by an independent system operator to those supplying electricity to the power grid. Typically this is data that has been edited, validated, and is appropriate for the independent system operator or other settlement agent to use for settlement and billing purposes.
FSR	Feasibility Study Report
Generation	The act of converting various forms of energy into electricity such as oil, gas, sunlight, or wind.
Generator	An entity capable of producing electrical energy.
Grid	The electrical transmission and distribution system linking power plants to customers through high power transmission line services. The U.S. bulk power transmission system is directly serviced by three of the five electric networks (power grids) in North America, consisting of extra-high-voltage lines designed to permit the transfer of electric energy across the network. The three networks are: the Eastern Interconnected System, consisting of the eastern two-thirds of the United States; the Western Interconnected System, consisting primarily of the Southwest and areas west of the Rocky Mountains; and the Texas Interconnected System, weakly interconnecting with the others by direct current lines. The other two networks have limited interconnections. Both the Western and Texas Interconnects are linked with parts of Mexico. The Eastern and Western Interconnects are integrated with most of Canada or have links to the Quebec Province power grid. Virtually all U.S. utilities are interconnected with at least one other utility by these major grids except Alaska and Hawaii. Within each power grid, utilities that own or control generation and transmission buy and sell power among themselves.
Green-e	Green-e is a non-governmental, non-profit program designed to help consumers easily identify renewable electricity products. Green-e certified electricity products contain at least 50 percent renewable power and meet certain environmental criteria. The electric service provider applying for Green-e certification must sign a code of conduct and must verify the content of their electricity products.
Hydroelectric Power	Hydroelectricity is the process of generating electricity by harnessing the power of moving water. Hydroelectric power is

Word or Phrase	Definition
	generated by forcing water that is flowing downstream (often from behind a dam) through a hydraulic turbine that is connected to a turbine. For renewable energy considerations, distinctions are sometimes made between "large hydro" (such as the large facilities that operate in the Pacific Northwest) and "small hydro." Small hydro in the United States can mean 30MW, however, a value of up to 10 MW total capacity is becoming generally accepted. Small hydropower is considered to have the least environmental impact and is generally considered a renewable energy generation source for many state RPS'.
IC	Institutional Committee
IEEE	Institute of Electrical and Electronic Engineers
Institute of Electrical and Electronic Engineers	A non-profit, technical professional association that, through its members, is a leading authority in technical areas ranging from computer engineering, biomedical technology and telecommunications, to electric power, aerospace and consumer electronics, among others. Establishes and publishes standards and professional certifications.
Institutional Committee	The WREGIS Institutional Committee is a committee within the WREGIS Working Group responsible for providing recommendations on the institutional structure, legal requirements, and governance policies necessary to create an institution to support and maintain the on-going operations of WREGIS.
IT	Information Technology
ITSB	California Energy Commission Information Technology Services Branch
IOU	Investor Owned Utility
Investor Owned Utility	Synonymous with "electrical corporations."
Kilowatt	One thousand watts. A unit of measure for the amount of electricity needed to operate given equipment. A typical home using central air conditioning and other equipment might have a demand of 4-6 kW on a hot summer afternoon.
Kilowatt hour	The most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour. A typical California household consumes about 500 kWh in an average month.
kW	Kilowatt
kWh	Kilowatt hour
Marketer	An agent for generation projects who markets power on behalf of the generator and may also provide other ancillary services. Although a marketer may perform many of the same functions as a broker, a marketer represents the generator while a broker acts as a middleman.
Megawatt	One thousand kilowatts. One megawatt is about the amount of power to meet the peak demand of a large hotel.

Word or Phrase	Definition
Megawatt hour	A unit of measure describing the amount of electricity consumed over time. It means one megawatt of electricity supplied for one hour. Two typical California households consume about a combined total of 1 MWh in an average month, one household consumes about 0.5 MWh.
Metered	The independent measurement with a standard meter of the electricity generated by a project or facility.
MSW	Municipal solid waste
Municipal Solid Waste	All solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, and demolition and construction wastes that can be processed and burned to produce energy.
MW	Megawatt
MWh	Megawatt hour
NE-GIS	NEPOOL Generation Information System
NEPOOL	New England Power Pool
NEPOOL Generation Information System	An electricity generation tracking and registry system that records production details of all types of electricity generation in the NEPOOL control area, including renewable, coal, hydroelectric, natural gas, and nuclear fuel sources and produces electronic certificates for each MWh. Retail electric suppliers use the information to report compliance with requirements set by certain New England states.
New England Power Pool	Voluntary association of entities engaged in the electric power business in New England. NEPOOL members (participants) include investor-owned utility systems, municipal and consumer-owned systems, joint marketing agencies, power marketers, load aggregators, generation owners and end users. This association also administers the NE-GIS system. A single NEPOOL control area encompasses Connecticut, Massachusetts, New Hampshire, Rhode Island, Vermont, and most of Maine. A single independent system operator interfaces with this association and the NE-GIS (ISO New England).
NERC	North American Energy Reliability Council
Net-metering	Excess green power generated from a customer's on-site generation facility is returned to the grid and the customer receives a credit from the servicing utility.
New York State Energy Research and Development Authority	A public benefit corporation established by 1975 law funding research into energy supply and efficiency, as well as energy-related environmental issues within New York. NYSERDA also finances environmental and energy improvements for the State's energy infrastructure. In cooperation with the NYS Public Service Commission, (PSC), NYSERDA manages the New York Energy $martSM program that offers energy efficiency, research and development, low-income and environmental disclosure funding and education to assist electric consumers. Through this program

Word or Phrase	Definition
	NYSERDA is at the time of this FSR exploring developing a generation tracking and registry system, referred to as the regional environmental attribute certificate accounting and trading system. REACTS is envisioned to support the state's current and future environmental policy requirements, including disclosure and the recently adopted renewable portfolio standard (RPS), as well as to support the development of competitive green power markets.
North American Energy Reliability Council	A voluntary organization that sets standards for the reliable operation and planning of the bulk electric system and monitors, assesses and enforces compliance with standards for bulk electric system reliability. The organization also: provides education and training resources; assesses, analyzes and reports on bulk electric system adequacy and performance; and, coordinates with Regional Reliability Councils and other organizations. This organization has established standards for the information ("tag") that accompanies an electronic request for an energy schedule and subsequent responses utilized in the electronic Transaction Information System (TIS) implemented by NERC.
NYSERDA	New York State Energy Research and Development Authority
On-site Renewable Generation	When end-use customers install their own renewable energy generating equipment at their facility or home to increase power reliability, provide stable electricity costs, and, potentially, receive utility credits or other incentives.
ORC	Operational Rules Committee
Operational Rules Committee	The Operational Rules Committee is a committee within the WREGIS Working Group responsible for drafting specific technical recommendations regarding WREGIS operational issues. This Committee was responsible for drafting the Interim Operating Rules for WREGIS that served as the basis for the FSR's business functional requirements.
PGC	Public Goods Charge
Pennsylvania, New Jersey, Maryland (PJM) Interconnection Association	A regional transmission organization (RTO) within the U.S. electric system ensures the reliability of the largest centrally dispatched control area in North America by coordinating the movement of electricity in all or parts of Delaware, Illinois, Maryland, New Jersey, Ohio, Pennsylvania, Virginia, West Virginia and the District of Columbia. The region covered by PJM is also referred to as the Mid-Atlantic region. At the time of this FSR, the PJM Interconnection Association is also exploring developing a renewable energy generation tracking and registry system, referred to as Generation Attribute Tracking System (GATS).
PMI	Project Management Institute
Power Content Label	A standard format for displaying an electricity service provider's generation type in a standardized format for customer disclosure

Word or Phrase	Definition
	purposes. These labels sometimes also include prices, terms of contracts with customers, air emissions and labor practices. Some states require standard disclosure labels. (Also referred to as a resource disclosure label.)
Power Purchase Agreement	This refers to a contract entered into by an independent power producer and an electric utility. The power purchase agreement specifies the terms and conditions under which electric power will be generated and purchased. Power purchase agreements require the independent power producer to supply power at a specified price for the life of the agreement. While power purchase agreements vary, their common elements include: specification of the size and operating parameters of the generation facility; milestones in-service dates, and contract terms; price mechanisms; service and performance obligations; dispatchability options; and conditions of termination or default.
PPA	Power Purchase Agreement
Procurement	For the purposes of PUC section 399,14 (g), refers to a utility acquiring the renewable output of electric generation facilities that the utility owns or for which it has contracted.
Project Management Institute	A non-profit professional organization dedicated to advancing the standards and practice of project management. In doing so PMI establishes standards, publishes best practices and offers professional certification.
Public Goods Charge	A surcharge applied to the electric bills of IOU ratepayers used to support energy efficiency, public interest research, development and demonstration of, low income, and renewable energy programs and collected pursuant to Public Utilities Code section 399 in California. In other states this charge may be referred to as a Public Benefits Charge, System Benefits Charge or Public Benefits Fund.
QFs	Qualified Facilities
Qualified Facilities	An individual (or corporation) who owns and/or operates a generation facility, but is not primarily engaged in the generation or sale of electric power. In California, QFs are either renewable power production or cogeneration facilities that qualify under Section 201 of PURPA.
REC	Renewable Energy Certificate
Regional Control Areas	See Control Areas.
Renewable	A power source other than a conventional power source within the meaning of Section 2805 of the Public Utilities Code.
Renewable Energy Certificate	Represents the separable bundle of non-energy or non-commodity attributes (environmental, economic, and social) associated with the generation of renewable electricity; the attributes of a given unit of renewable generation, separated from the underlying electrical energy. Green tag, green ticket, and tradable renewable

Word or Phrase	Definition
	certificate (TRC) are often used synonymously with REC. In WREGIS these types of certificates will be referred to as *WREGIS Certificates* to avoid confusion that could be introduced when states or provinces participating in WREGIS have different definitions for the type of electricity generation that can be included in a REC.
Renewable Energy Program	A California Energy Commission program that began in 1998 to help increase total renewable electricity production statewide. The current program provides market-based incentives for new and existing utility-scale facilities powered by renewable energy. Energy Commission Order No. 03-0305-04 authorizes the Renewables Committee (Committee) to oversee implementing the RPS under SB 1078 and SB 1038.
Renewables Portfolio Standard	For the purposes of this document, the term refers to California's Renewables Portfolio Standard pursuant to SB 1078. In PUC section 399.12© the law states that, " 'renewables portfolio standard' means the specified percentage of electricity generated by eligible renewable energy resources that the retail seller is required to procure…" Under the RPS, an electrical corporation must increase its total procurement of eligible renewable energy resources by at least an additional 1 percent of retail sales per year so that 20 percent of its retail sales are procured from eligible energy resources no later than December 31, 2017. Several initiatives have aimed at "accelerating" this schedule to a target of 2010 rather than 2017. The 2010 target was formally adopted in a joint agency report, the Energy Action Plan adopted by the California Energy Commission, the CPUC, and the California Power Authority (dated May 8, 2003). In addition, the California Energy Commission adopted the 2003 Integrated Energy Policy Report (publication number 100-03-019, docket 02-IEP-1, December 2003) which states: "The Energy Commission also believes that the development of more ambitious longer-term RPS goals for the post 2010 period is warranted." (page 13)
REP	Renewable Energy Program
RPS	Renewables Portfolio Standard
RESIA	Reliable Electric Service Investments Act
SB	Senate Bill
Settlement	A financial settlement process (billing and payment) for products and services purchased and sold; each settlement will involve a price and a quantity. CEC proposes using settlement data as the source for creating Renewable Energy Certificates (RECs).
SDD	System Design Document
SRD	System Requirements Document
System Design Document	A document that describes the design that will guide the development of an information system. The design emerges from a

Word or Phrase	Definition
	complete and agreed to SRD. Design documents often include mock-ups and detail definition of the screens, reports, and data structures as well as a description of the underlying system architecture. This project deliverable serves as an opportunity to ensure all pertinent parties agree to *how* the requirements will be addressed and that those who will build the system follow a common set of specifications that ensure all the parts of the system will integrate and interoperate to provide the system functionality needed to meet the requirements.
System Requirements Document	A document that specifies an information system's requirements at a more detailed level than do the business functional requirements. This project deliverable serves as an opportunity to ensure all pertinent parties understand and share a common agreement about *what* the system needs to do before the system solution is designed, programmed, tested, and implemented.
SEP	Supplemental energy payments
SOW	Scope of Work
Supplemental Energy Payments	Incentive payments from the Energy Commission to eligible renewable generators for the costs above the market referent of energy procured to meet the RPS, pursuant to PUC section 399.15 (a) (2). Any indirect costs from procuring eligible renewable resources – such as imbalance energy charges, sale of excess energy, decreased generation from existing resources, or transmission upgrades – are not eligible for SEP. The cost of the contract bids for renewable resources that are selected by the utilities to meet their RPS obligation will be compared to the cost of a comparable non-renewable product, the market price referent. Costs for renewable products that exceed the referent, excluding indirect costs noted above, will be covered by the SEP, subject to availability of Public Goods Charge (PGC) funds, pursuant to PUC section 399.15 (a) (4). The Energy Commission will distribute the SEP directly to the renewable generator through its New Renewable Facilities Program.
WECC	Western Electricity Coordinating Council
Western Electricity Coordinating Council	One of ten (10) reliability councils responsible for establishing standards, policies, and guidelines for coordination of the bulk power supply within the U.S. WECC is responsible for developing planning and operating reliability criteria and policies within the Western Interconnection, overseeing compliance with these criteria and policies through its Compliance Monitoring Review Process and Reliability Management System, and facilitating a Regional transmission planning process. WECC was created in 2002 from the merger of the Western Systems Coordinating Council (WSCC), Southwest Regional Transmission Association (SWRTA), and Western Regional Transmission Association

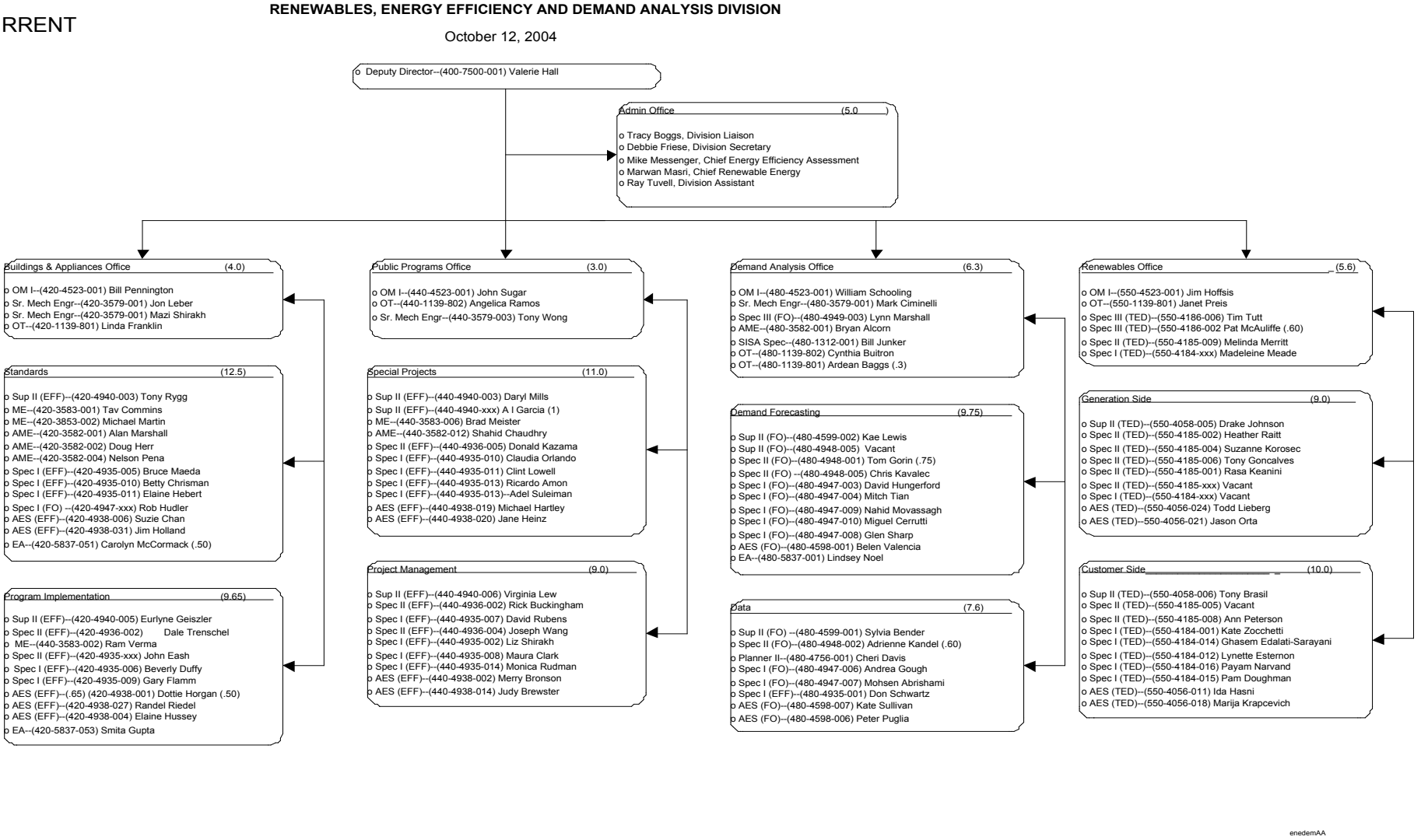
Word or Phrase	Definition
	(WRTA).
Western Governors' Association	The Western Governors' Association is an independent, nonprofit organization representing the governors of 18 states and three U.S.-flag islands in the Pacific. Through their Association, the governors identify and address key policy and governance issues in natural resources, the environment, human services, economic development, international relations and public management. WGA is co-sponsoring the WREGIS project in conjunction with California Energy Commission.
Western Interconnection	The geographic area containing the synchronously operated electric transmission grid in the western part of North America, which includes parts of Montana, Nebraska, New Mexico, South Dakota, Texas, Wyoming, and Mexico and all of Arizona, California, Colorado, Idaho, Nevada, Oregon, Utah, Washington, and the Canadian Provinces of British Columbia and Alberta.
Western Interstate Energy Board	The Western Interstate Energy Board is an organization of 12 western states and three western Canadian provinces, which are associate members of the Board. The governor of each state appoints a member to the Board. The legal basis of the Board is the Western Interstate Nuclear Compact (Public Law 91-461). The Western Interstate Energy Board, a part of the Western Governors' Association, is comprised of multiple committees.
Western Renewable Energy Generation Information System	An automated web-based renewable energy tracking and registry information system that receives data on renewable energy generation, creates WREGIS certificates, and supports Account Holders in managing those certificates in an account/subaccount structure similar to that of a banking system. WREGIS is intended to be a policy-neutral system used to track renewable energy generation within the Western Interconnection for purposes of demonstrating regulatory and voluntary program compliance. WREGIS also includes the program staff to establish the policies, promote participation, and perform the administrative operation functions needed to support the information system and WREGIS participants.
Western Regional Air Partnership	A collaborative effort of tribal governments, state governments and various federal agencies to implement the Grand Canyon Visibility Transport Commission's recommendations and to develop the technical and policy tools needed by western states and tribes to comply with the U.S. EPA's regional haze regulations. Administered jointly by the Western Governors' Association and the National Tribal Environmental Council.
Western States Tracking System	A database system for the purposes of power source disclosure (aka: fuel source disclosure) and developed based on a collaboration of the California Energy Commission, the Oregon Department of Energy, and the Washington State Office of Trade

Word or Phrase	Definition
	and Economic Development. The system contains contact information on electricity generating facilities in the U.S. portion of WECC. The system also allows regulators in California, Oregon and Washington to compare claims regarding renewable energy generators.
WGA	Western Governors' Association
WIEB	Western Interstate Energy Board
WRAP	Western Regional Air Partnership
WREGIS	Western Renewable Energy Generation Information System
WREGIS Certificate	The electronic record of renewable energy generation, including all of the data fields associated with the MWh of generation as recorded in WREGIS, and as identified by a unique serial number. WREGIS Certificates will be created for generation that is accepted as renewable energy by any regulatory or voluntary program within the states and provinces within the Western Interconnection. . Not all Certificates created and tracked in WREGIS will necessarily meet a particular state's definition of a REC.
WREGIS Working Group	A voluntary working group comprised of WREGIS stakeholders hosted by the Western Governors' Association. This group includes several committees dedicated to recommending specific areas of WREGIS' proposed functioning. These include the Institutional Committee, the Operational Rules Committee, the Data Interface Sub-Committee and the Stakeholder Advisory Committee.
WREGIS-DISC	Synonymous with DISC, the Data Interface Sub-Committee within the WREGIS Working Group.
WREGIS-IC	Synonymous with IC, the Institutional Committee within the WREGIS Working Group.
WREGIS-ORC	Synonymous with ORC, the Operational Rules Committee within the WREGIS Working Group.
WSTS	Western States Tracking System

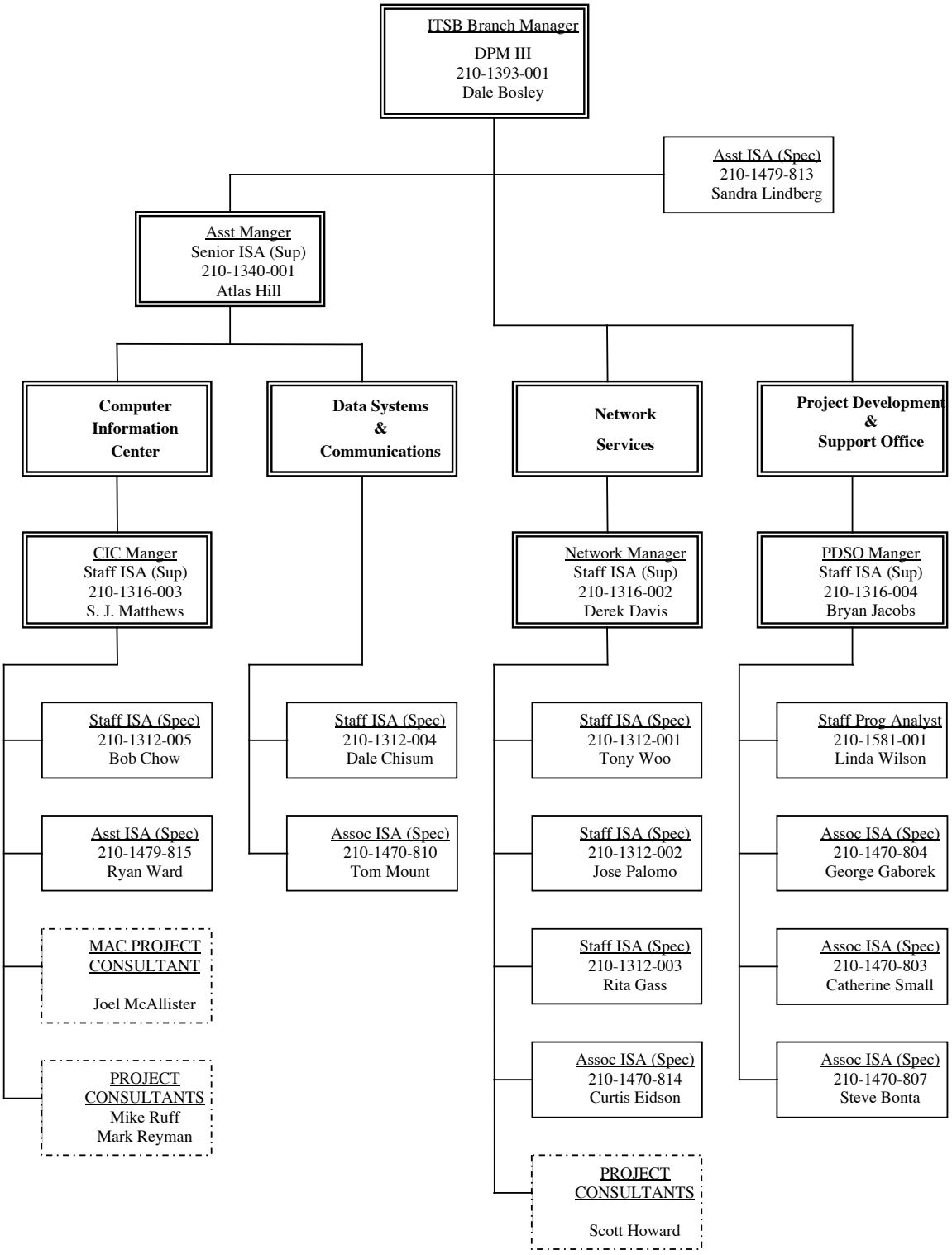
9.2 Organization Charts

Energy Commission, Renewables, Energy Efficiency, and Demand Analysis Division

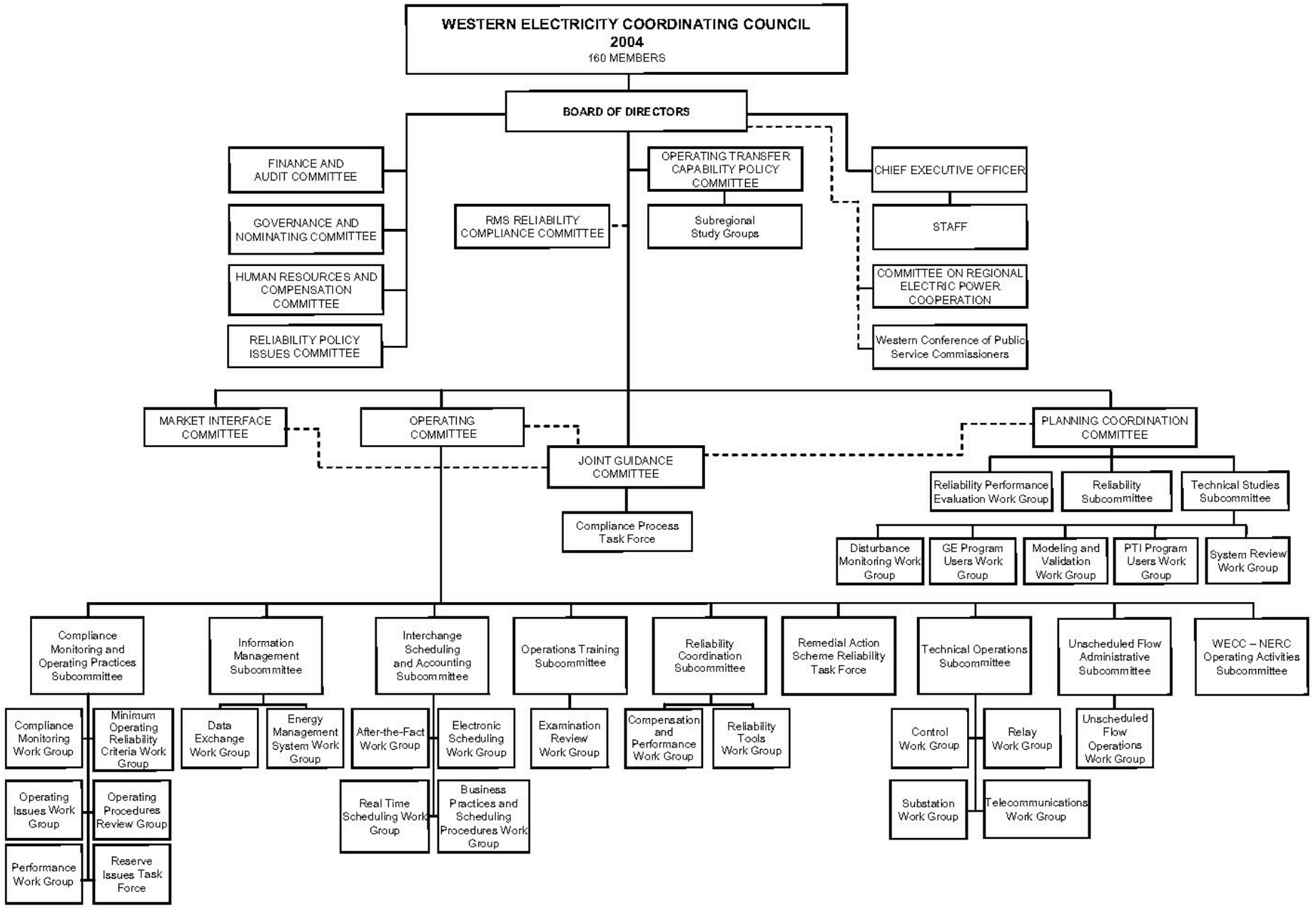
CURRENT



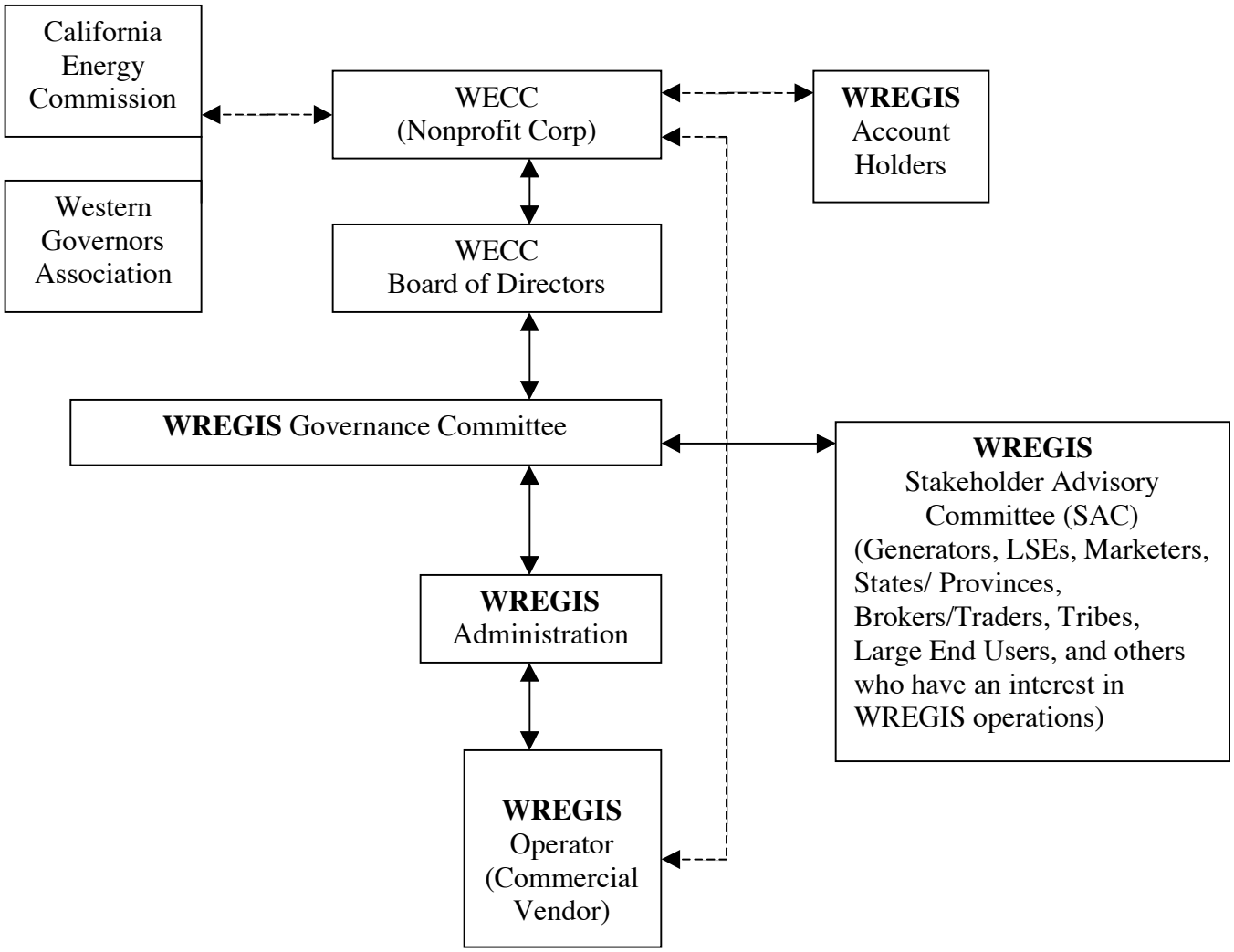
Energy Commission, Information Technology Services Branch



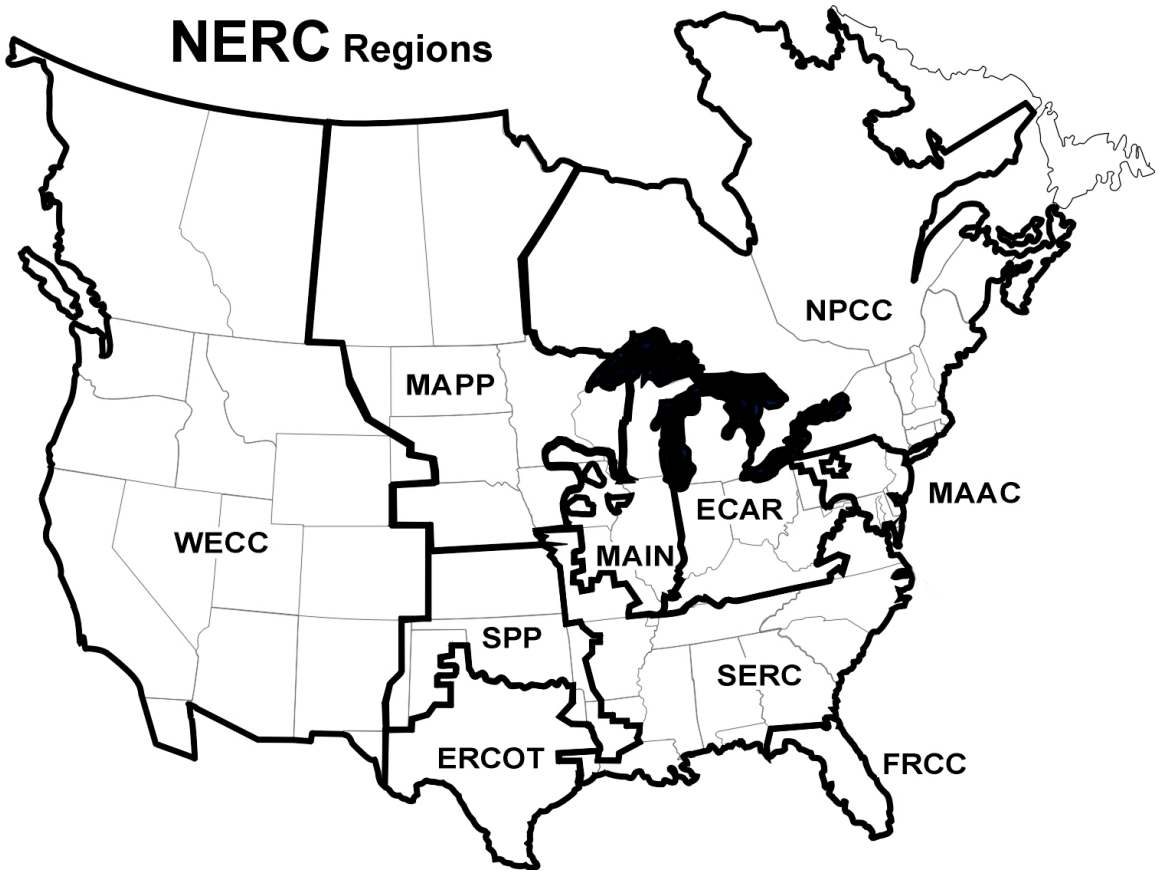
Western Electricity Coordinating Council



Western Electricity Coordinating Council, WREGIS Program Organization



North American Electricity Reliability Council Regions



9.3 Revision History

Revision	Date of Release	Purpose
1.6	10/22/04	Initial release to DOF
1.7	1/14/05	Response to DOF questions received 12/10/05
1.8	2/11/05	Response to DOF questions received 01/31/05
1.9	2/24/05	Response to DOF questions and suggestions received 02/18/2005.