

THE FUTURE OF DISTRIBUTED GENERATION IN MEXICO
TECHNICAL WORKSHOP ON EFFICIENCY, RENEWABLES AND GRID
MANAGEMENT

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AGENDA

1. Public policies to promote distributed generation in Mexico.
2. Off-grid projects for rural electrification.

IMPLEMENTATION OF ELECTRICITY SECTOR REFORM

(COMPLETED SO FAR)

(NEXT MILESTONES)

2014

2015

2016 - 2018

Wholesale
electricity
market

- Independent System Operator CENACE (August).
- First draft version of Interconnection Criteria for Power Generators (Dec 2014).

- Guidelines for Power Generation Permits (March).
- Standard Interconnection Agreements (Pending).
- First draft version of Operational Rules (February).
- Information system testing (October):
 - Real time
 - Day ahead
 - Financial transmission right
 - Power allocation
 - Long-term auctions

- Operation of the wholesale market (January 2016).

- Medium-term auctions (August 2016).

Transmission &
Distribution

- Universal Power Service Fund (Aug 2014).

- Program for the expansion of the electric power system (June).
- Financial transmission rights (August).

Electricity
industry

- Electric industry law regulation (October 2014).

- Terms and conditions for CFE unbundling (May).
- CFE restructuring (December).

Clean energies

- Guidelines for CELs (Oct 2014).

- 2018 Clean Energy obligations (March).
- CFE Request and Granting of Geothermal fields (January-July).
- Bids for other geothermal field sites (August).
- Bids for basic service supply (August-December).

- Test for CELs (January 2018).

DISTRIBUTED GENERATION AND SMART GRIDS

Before Reform

- Generation in small installations could not sell surplus.
- Credit was awarded toward consumption, but avoided rates were often lower than market values.



Only users on the highest rates had incentives to install distributed generation.

After Reform

- Regulated suppliers will pay a regulated price for surplus energy.
- Unregulated suppliers can buy from all users at market prices.
- Minimal regulation of on-site sales.



Distributed generation will earn a fair payment.

Specialized companies can market distributed generation.



WHAT ARE THE MAIN BENEFITS OF DG IN MEXICO?

1. Lower subsidies granted to household users via electricity tariffs.

2. Subsidies totaled approximately 5 billions USD per year.

3. Reduce technical and non-technical losses.

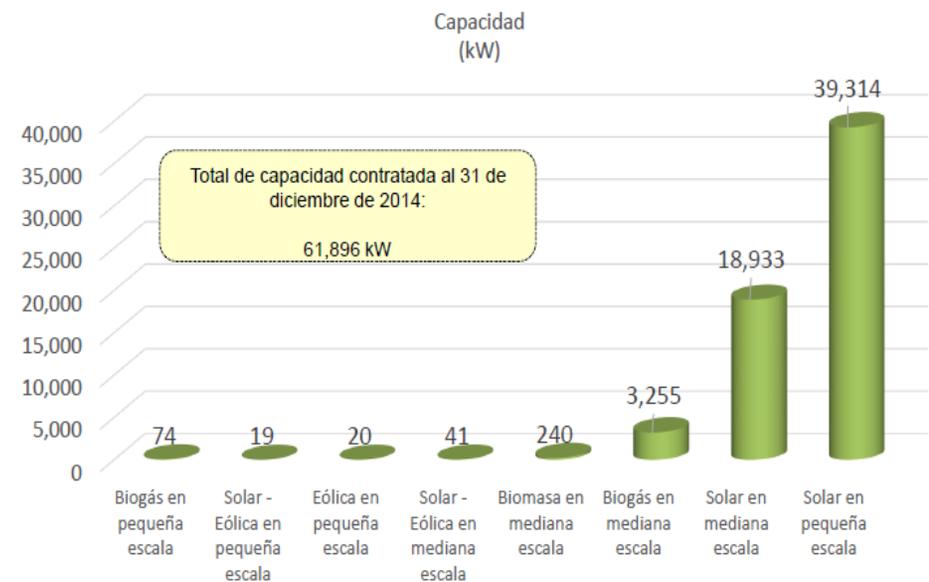
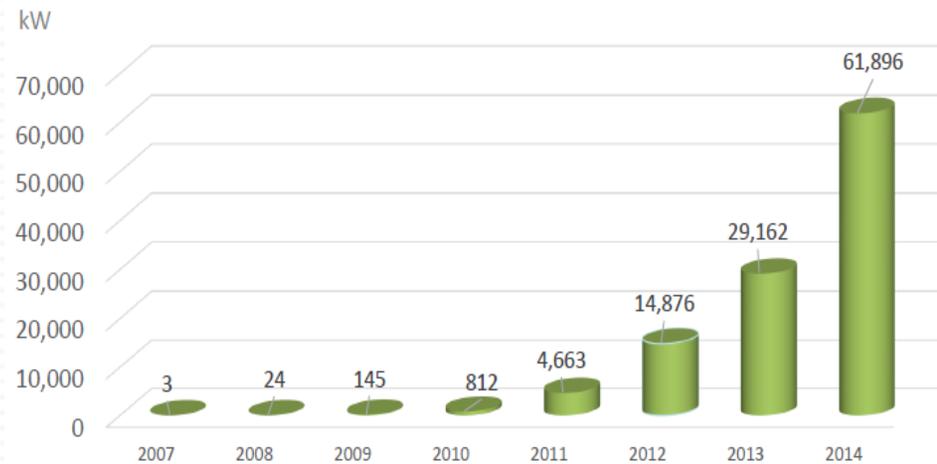


4. Achieve national (PEAER) and international goals on universal access to electricity services (SE4ALL).

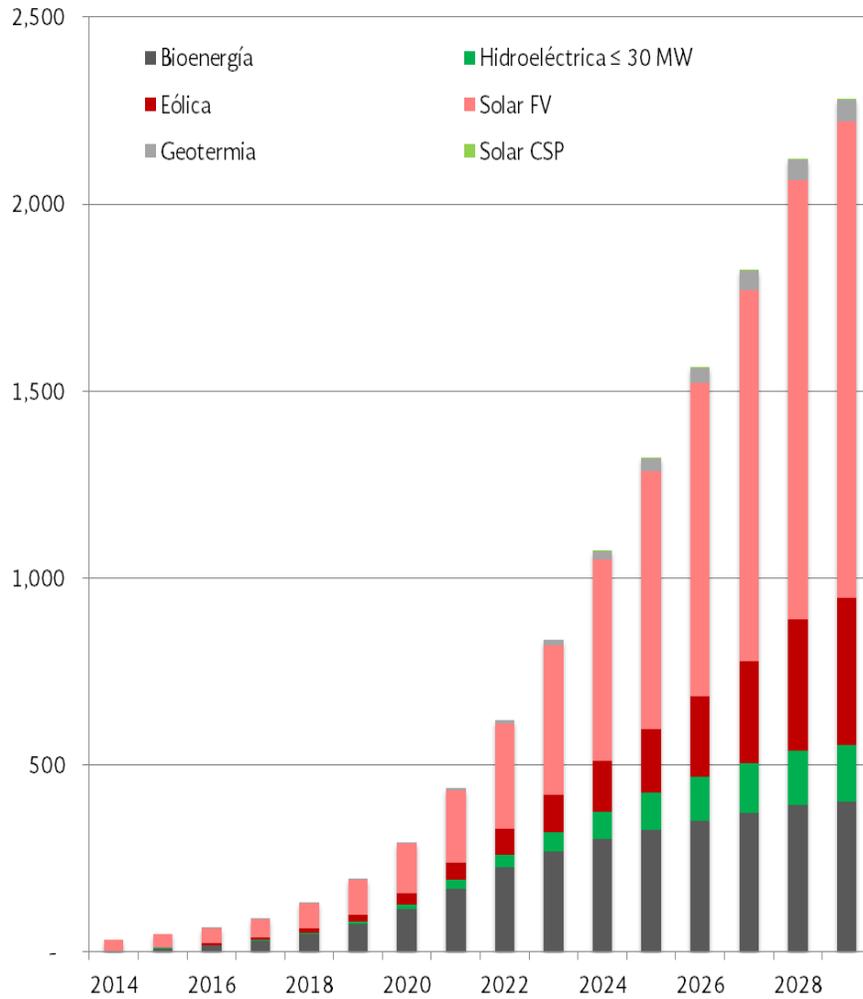


EVOLUTION OF DISTRIBUTED GENERATION IN MEXICO

- DG has increased from 3 kW in 2007 to 62 MW in 2014 .
- As of year 2014, DG more than doubled vs 2013.
- 94% of this capacity corresponds to solar PV (Systems below 500 kW).
- Biogas is the second dominant RE source.



PROSPECTS FOR DISTRIBUTED GENERATION IN MEXICO



(MW additions vs 2014)

2018 2024 2028

SOLAR	+ 50	+657	+1,237
BIOENERGY	+ 64	+316	+394
WIND	+ 16	+168	+394
HYDRO (SMALLER OR EQUAL TO 30 MW)	+ 8	+100	+150

WHAT IS SENER DOING IN THE FRAME OF DG IN MEXICO?



- Biomass.
- Isolated systems (BCS)

- Solar energy.
- Waste to energy.
- Labor competences.
- Isolated systems (BCS)
- Support mechanisms for PV.



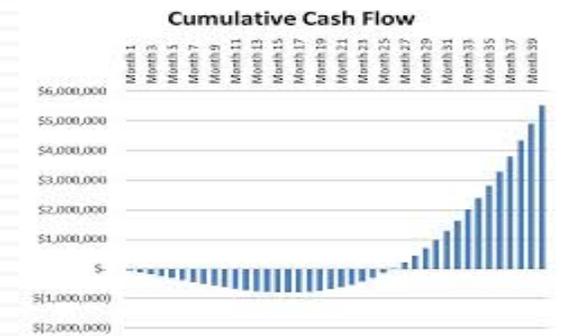
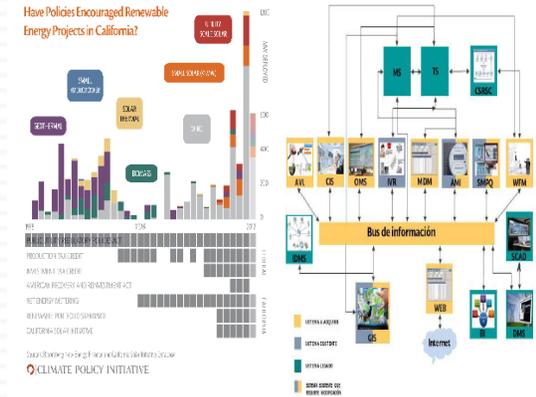
- DG roadmap.
- Smart grids roadmap.
- Isolated systems (BCS)

- Support mechanisms for PV

1. Clean Energy Ministerial and the 21st Century Power Partnership initiative.
2. Mexican - Danish Program on Energy and Climate Change.
3. Mexican - German Program on Sustainable Energy.
4. Latin-American Regional Climate Initiative.

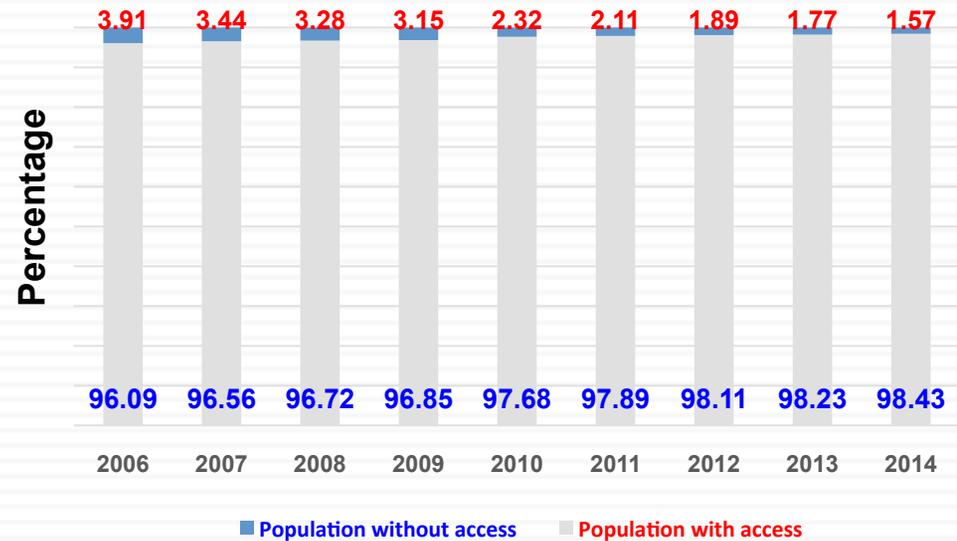
WHAT ARE CURRENT INITIATIVES FOR DG ADOPTION IN MEXICO?

1. Report on Regulatory Mechanisms for Enhancing the Adoption of Distributed Generation.
2. Implementation of Smart Grid Road Map for Mexico.
3. Support mechanisms for DG:
 - Subsidies reallocation for the acquisition of solar panels.
 - Solar branch of Productive State Enterprise CFE.
 - Solar Leasing (Solar City and ILLIOS).
 - Energy Transition Fund for DAC users and Small - Medium Enterprises.
 - Solar farms for collective services in public housing.

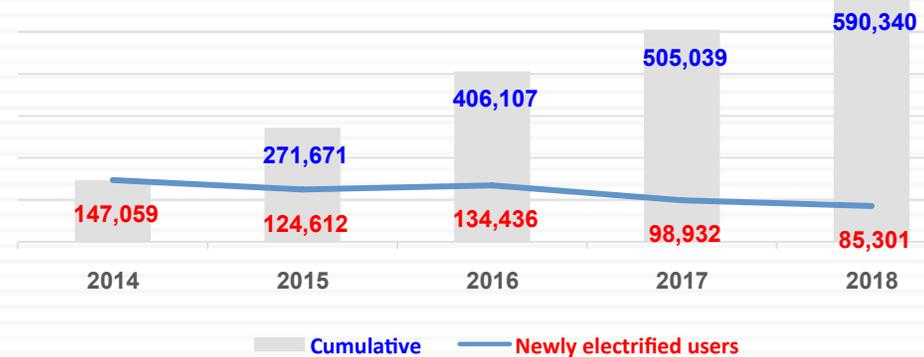


ACCESS TO ELECTRICITY SUPPLY IN MEXICO

- As of year 2014, Mexico has nearly achieved the universal access to electricity supply (Approx. 99%).



- CFE foresees that nearly 590 thousand newly users in rural communities will be benefited in the 2014 – 2018 period.



SPECIAL PROGRAM ON RE 2014 – 2018 (PEAER)

Objective 5. Grant access to renewable energy through rural electrification, heat applications and social participation.

Major lines of actions:

- Data base on rural communities without access to electricity supply.
- Use of Geographic Information Systems to identify communities without access.
- Implementation of novel investment models.
- Partnerships with local governments

Indicator: By 2018 at least 8% of newly electrified users in rural communities will be RE projects.

Activities to date:

- Integrated Energy Services Program (PSIE).

SENER

CFE

WB

Prospects:

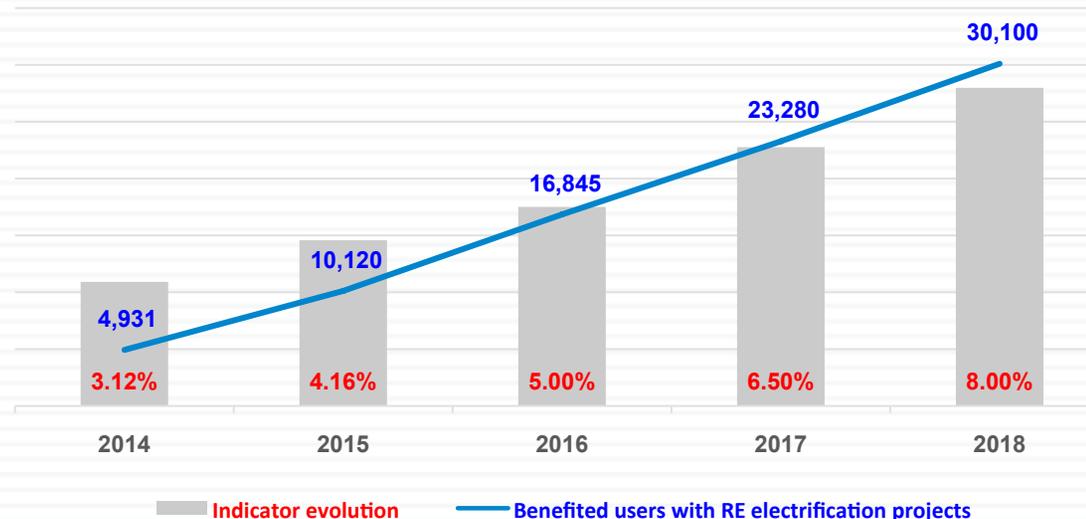
- Other rural electrification programs.

SENER

CFE

BID

ACCIONA Microenergia



INTEGRATED ENERGY SERVICES PROGRAM (PSIE)



WORLD BANK GROUP



COMISIÓN FEDERAL
DE ELECTRICIDAD

- PV systems battery backed-up and micro-grids (from 2 kW – 33 kW).
- Projects are administrated by CFE and end users are charged with a special social electricity tariff via electricity bills.
- A World Bank Grant leveraged trough SENER's Energy Transition Fund.
- Average project costs has been reduced due to economies of scale extending the project from 3 originally planned to 8 competitive bids processes.
- Project is expected to benefit more than 7,400 inhabitants located in 8 Mexican states.

PROSPECTS FOR RURAL ELECTRIFICATION WITH RE PROJECTS

- SENER, CFE and Acciona Microenergía Foundation are evaluating a collaboration agreement for supplying electricity to rural communities with less than 100 inhabitants.
- Project consists of a solar panel kit which can supply electricity for charging mobiles, powering radios, tvs and other appliances in 12 volts direct current.
- First project stage considers 4 Mexican states.



- Project will be implemented in the frame of the initiative Sustainable Energy for All (SE4ALL).
- IDB is interested in the development of 1 to 3 pilot projects in each of 4 countries in Latin America.
- SENER is interested in replicating more projects as those of the PSIE.

- Mandated by the Electricity Industry Law and established in August 2014.
- Fund is intended to finance rural electrification and marginalized urban zones.
- Among other sources, the Fund will channel revenues obtained from managing energy losses in the wholesale electricity market.
- SENER coordinates the Fund that will enter into operation from January 2016.



THANKS FOR YOUR ATTENTION

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