



# **COMPARATIVE COSTS OF CALIFORNIA CENTRAL STATION ELECTRICITY GENERATION TECHNOLOGIES**

## **2009 IEPR Workshop**

Date: August 25, 2009

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# AGENDA

- Summary of Key COG Results
- Comparison to 2007 IEPR
- Tax Treatment Issues
- Understanding the Model Results
- Workshop Questions



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# Summary of COG Results

- Traditional Levelized Cost Reporting
- Forecasted Trends in Instant Costs
- Forecasted Levelized Costs
- High-Low Levelized Costs
- Comparison to E3/CPUC 33% Study



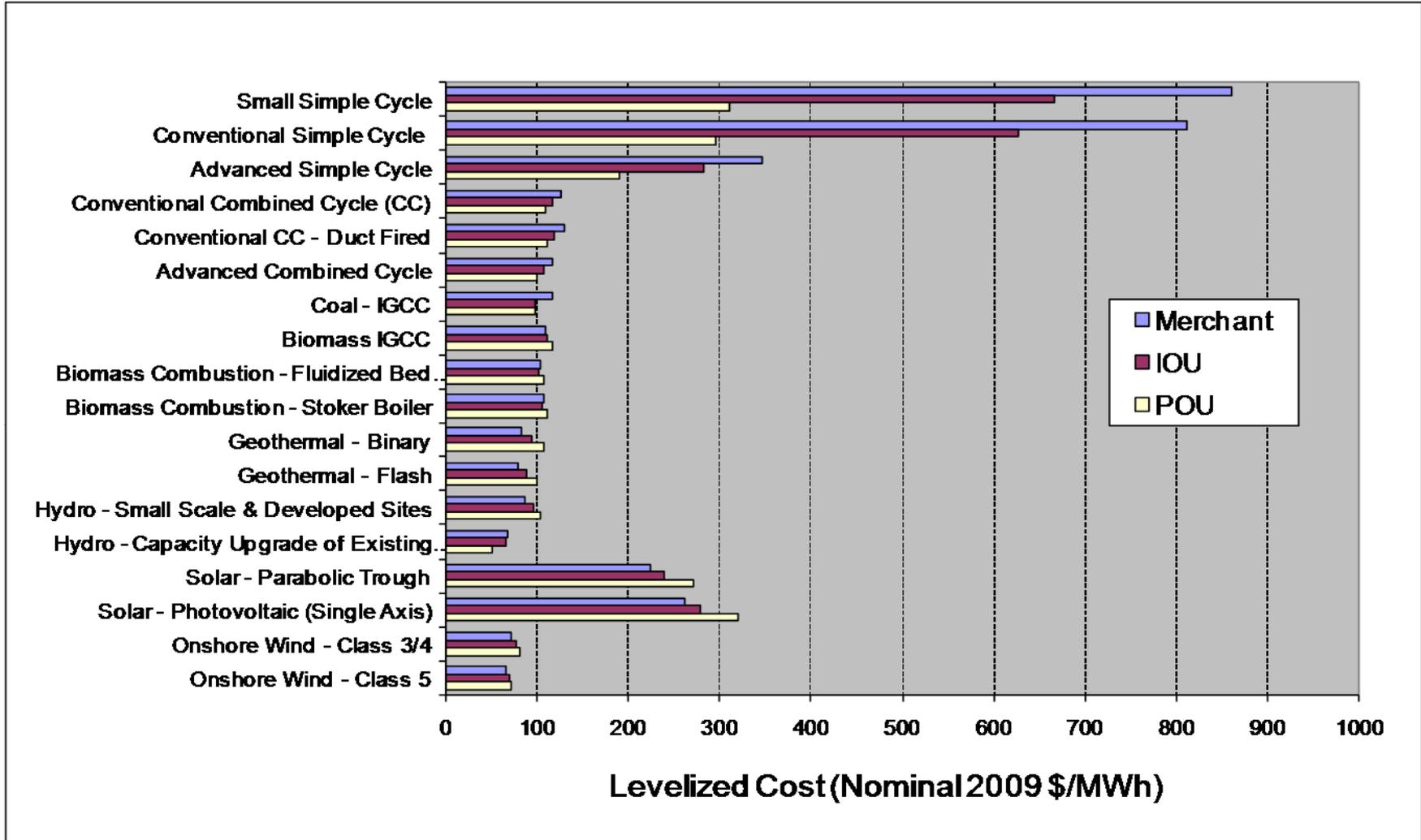
# Levelized Cost Components

- Fixed Cost
  - Capital & Financing
  - Insurance
  - Ad Valorem
  - Fixed O&M
  - Taxes
- Variable Costs
  - Fuel
  - Variable O&M
- Transmission Costs



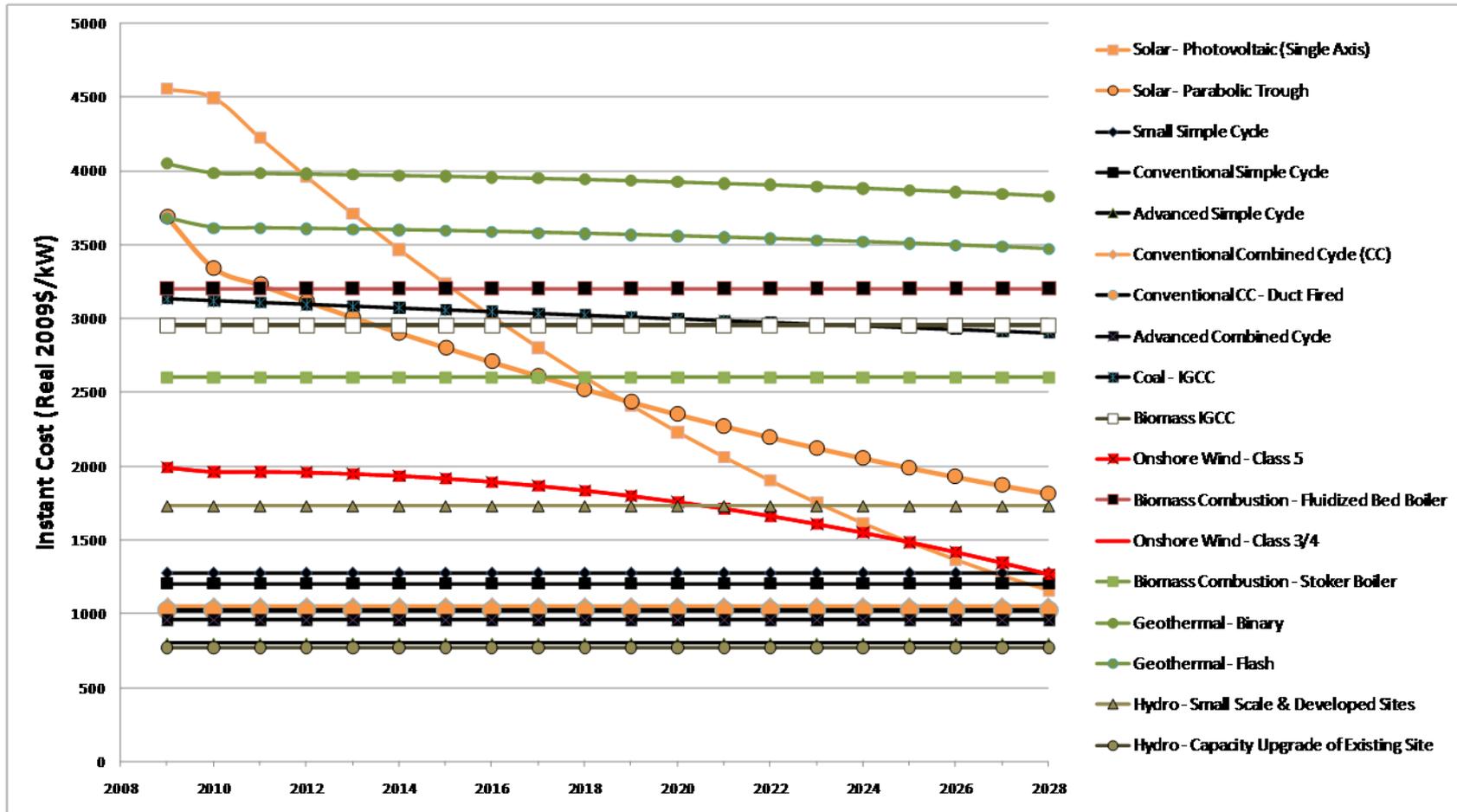
# Average Cost by Technology

Start Year = 2009 (2009 Nominal\$)



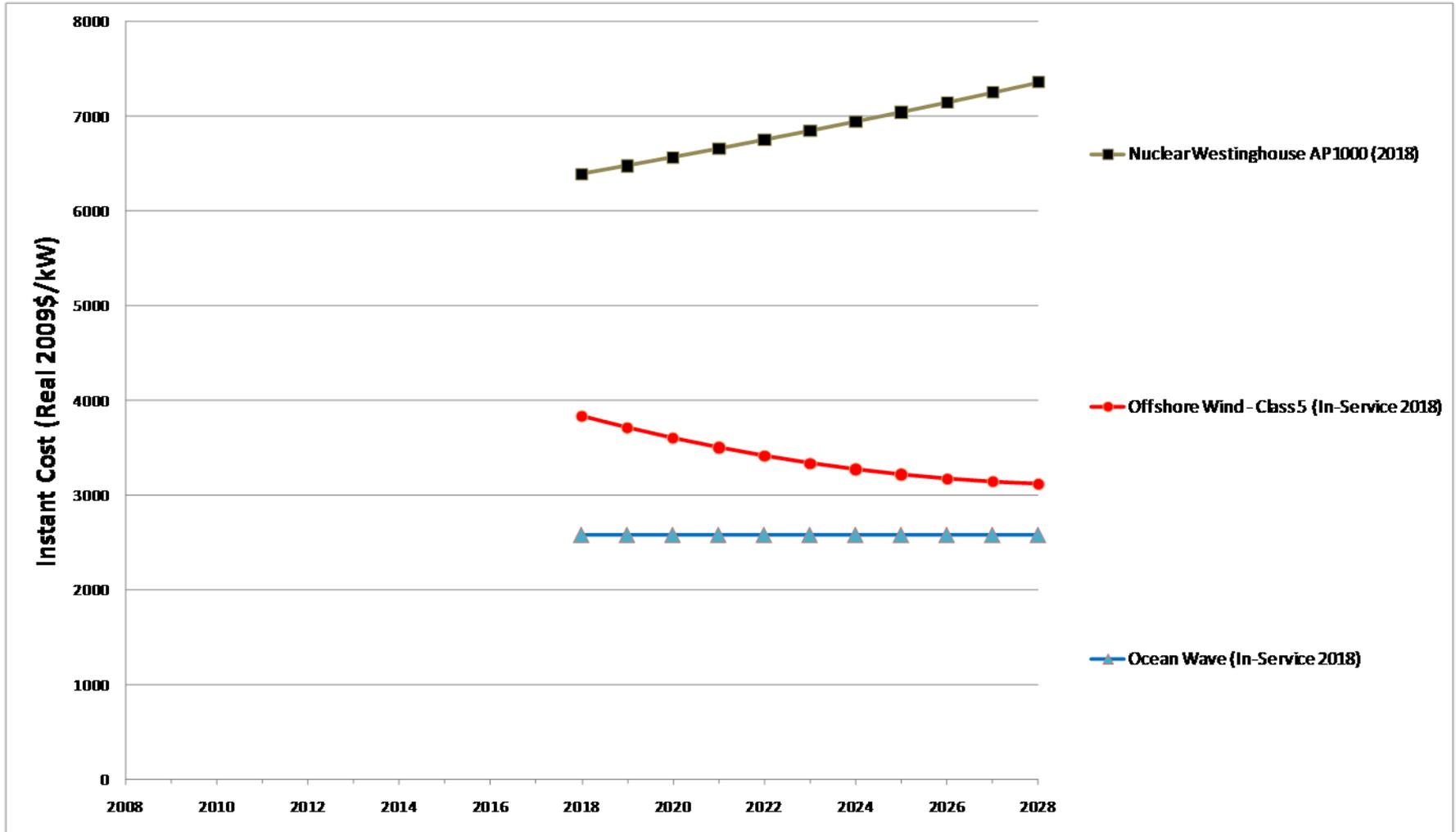


# Average Instant Cost Trends 2009 In-Service Technologies





# Average Instant Cost Trends Emerging Technologies

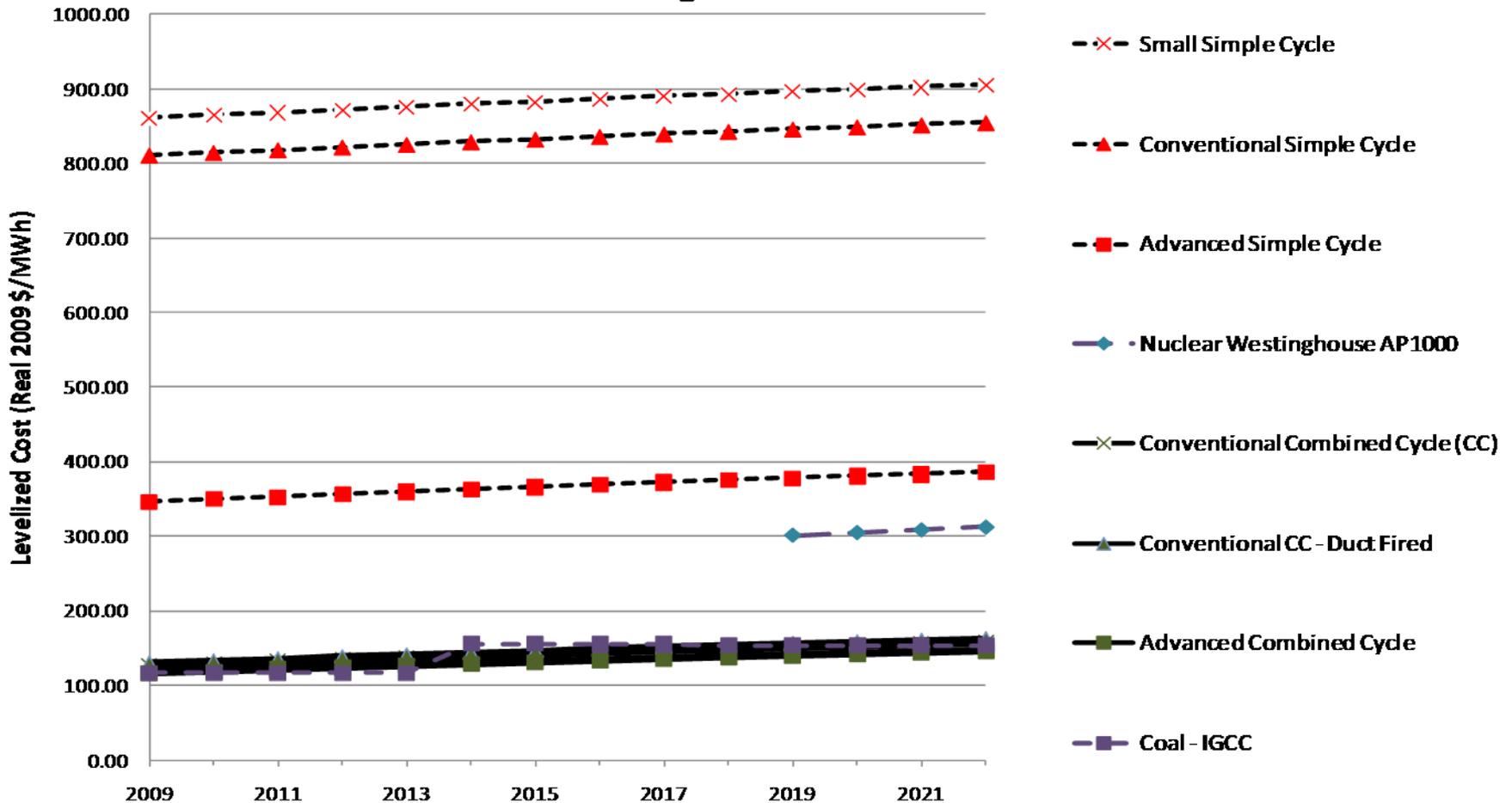




# Average Levelized Cost Trends

## Conventional Technologies

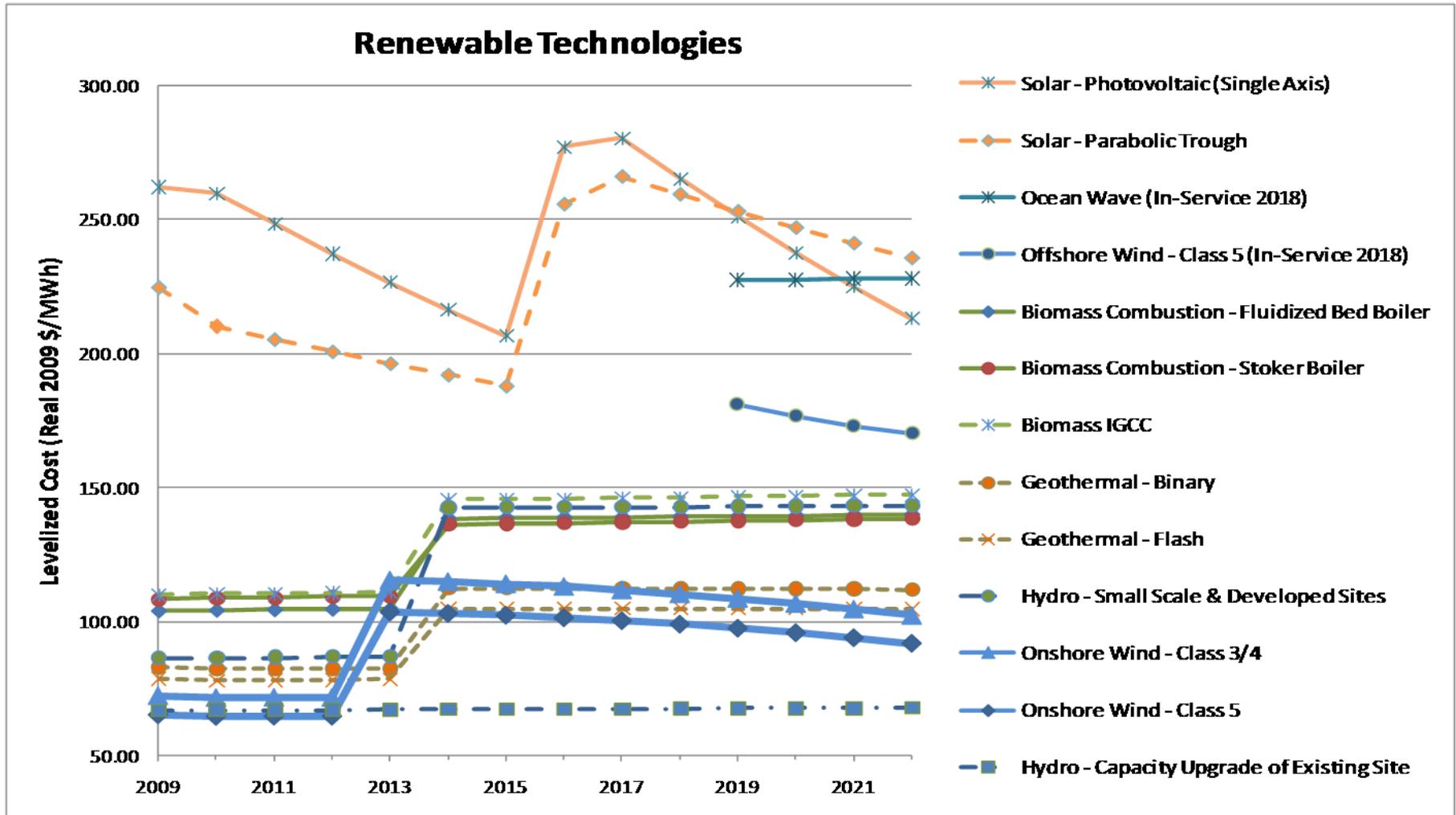
Conventional Technologies





# Average Levelized Cost Trend

## Renewable Technologies

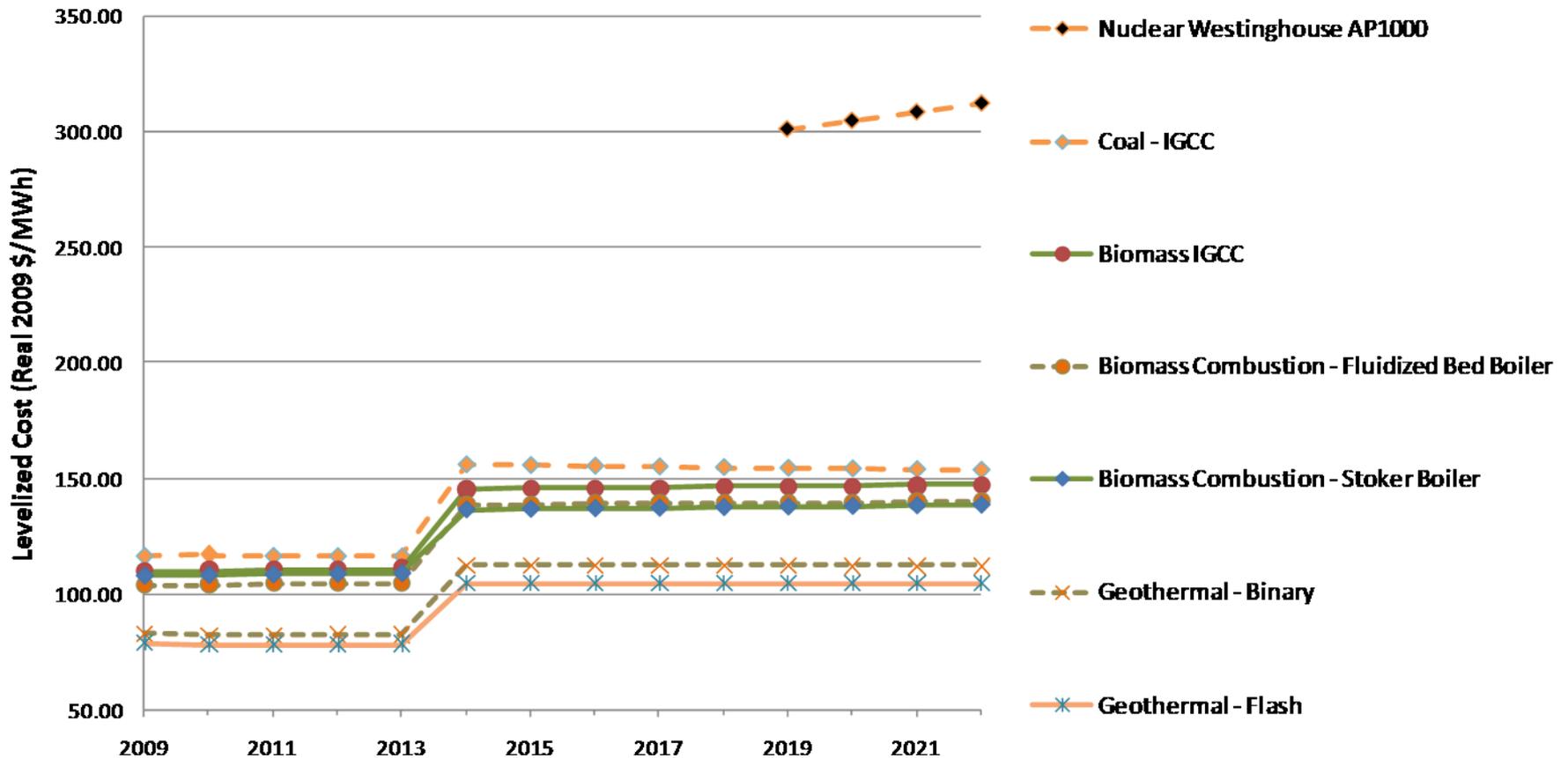




# Average Levelized Cost Trend

## Baseload Technologies

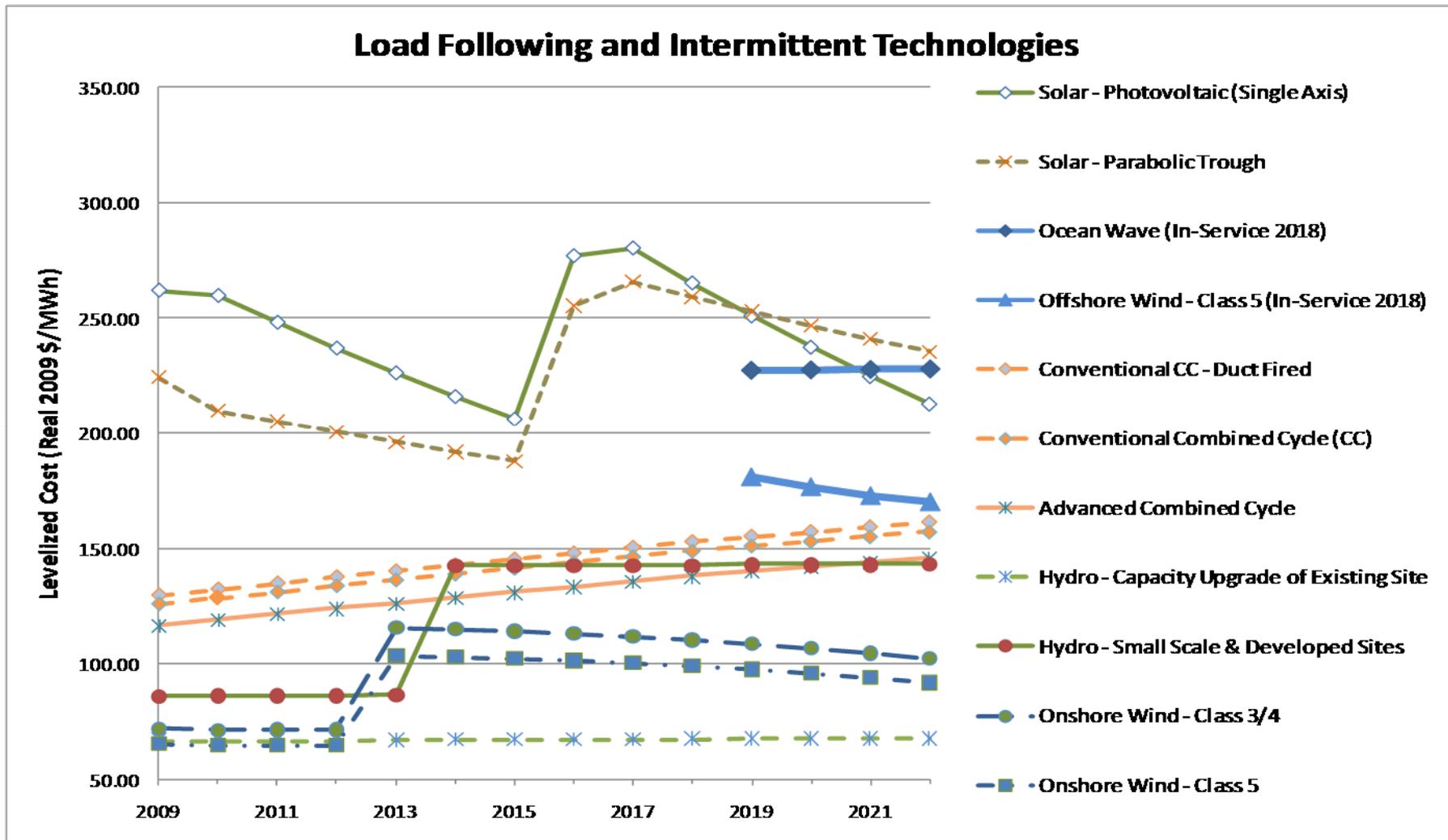
Baseload Technologies





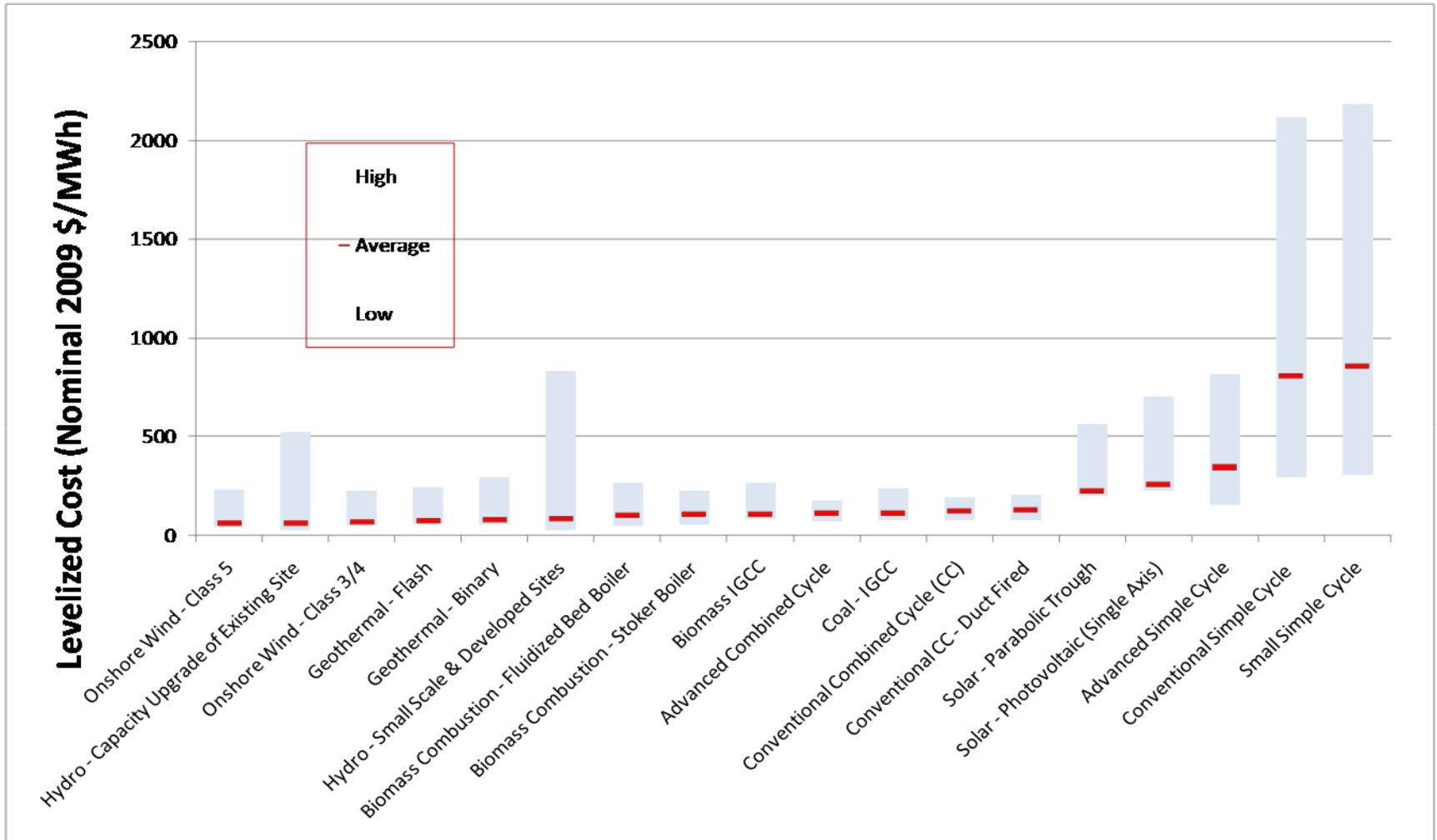
# Average Levelized Cost Trends

## Load Following and Intermittent Technologies



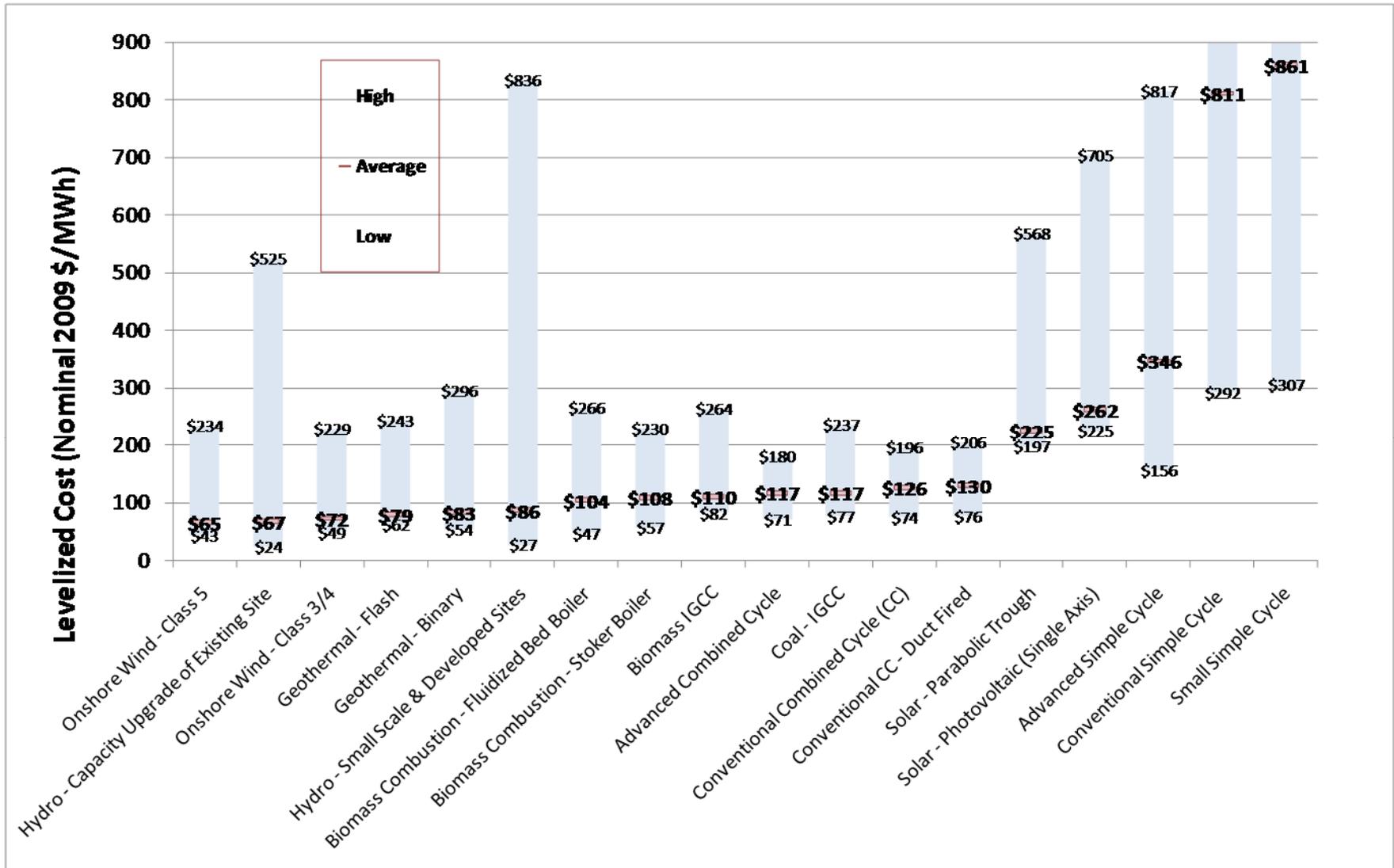


# Range of Levelized Cost Merchant Plant In-Service in 2009



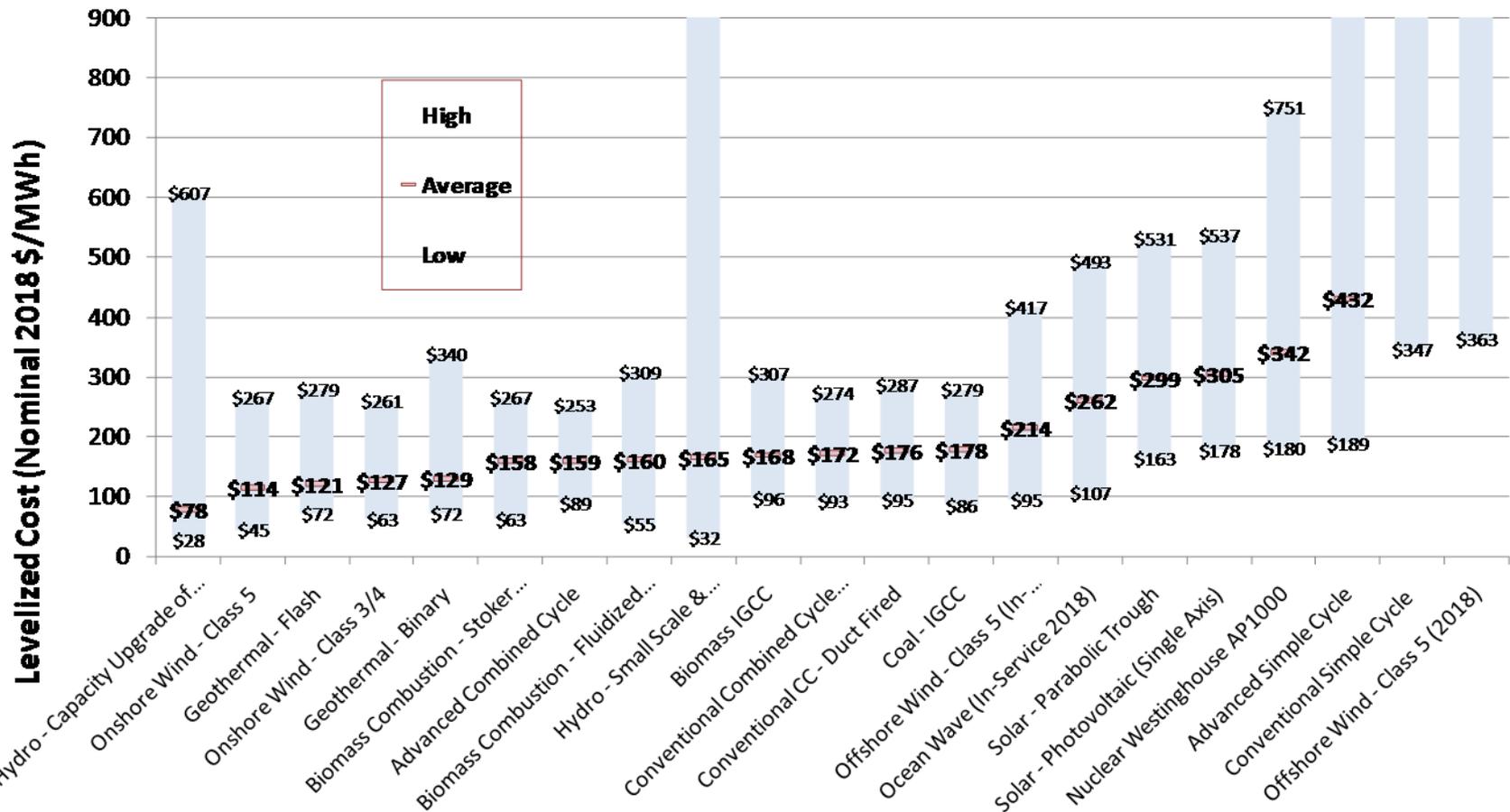


# 2009 MAGNIFIED





# Range of Levelized Cost Merchant Plant In-Service in 2018

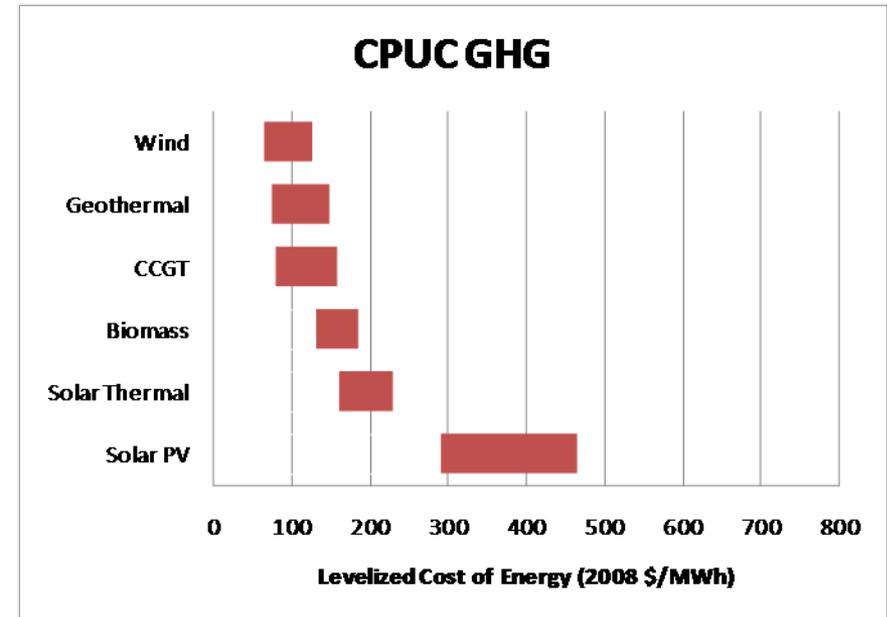
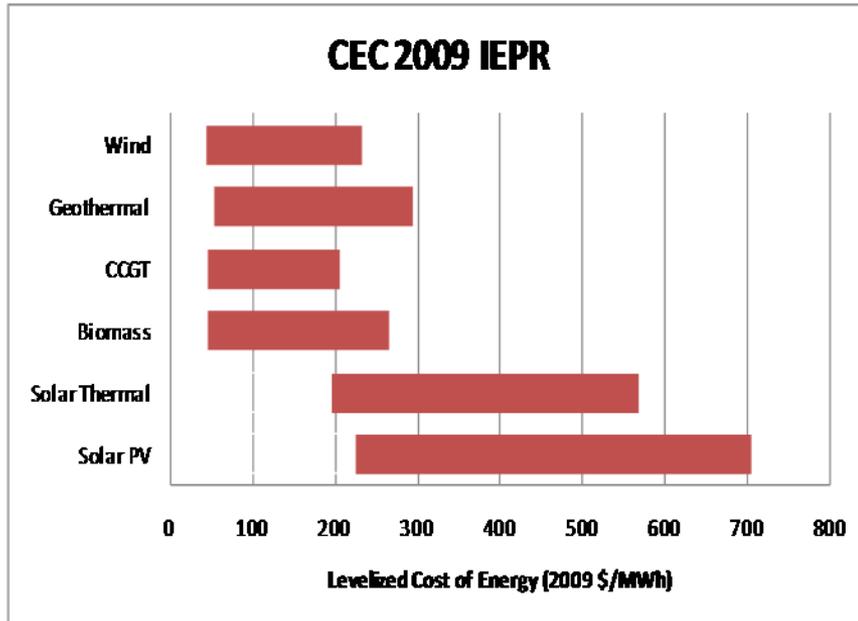




# Comparison to E3/CPUC

## 2009 IEPR COG Report

## June 2009 Preliminary E3/CPUC 33% RPS Report





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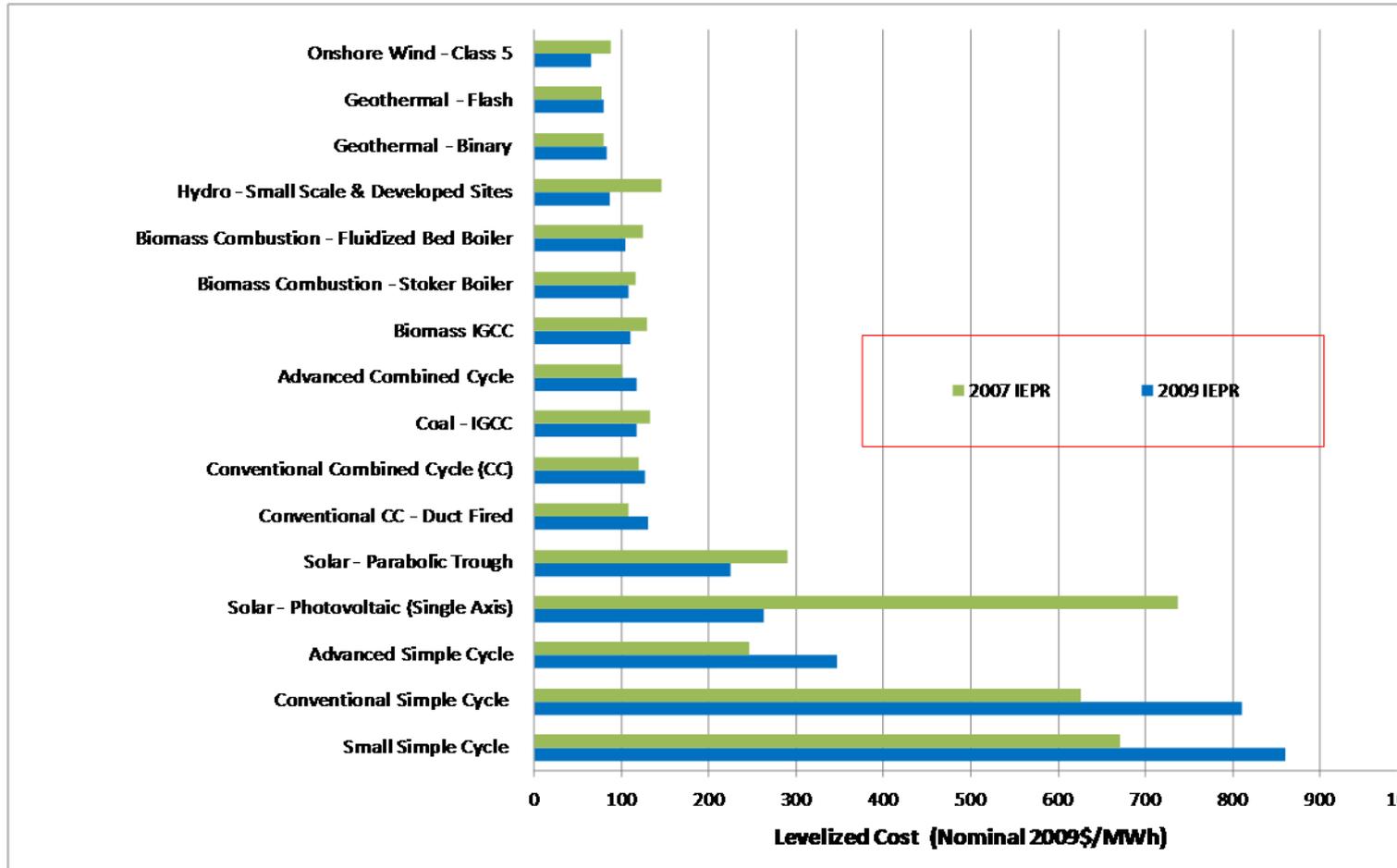
# Comparison to the 2007 IEPR

- Compare Levelized Costs
- Compare Key Variables
- Tax Accounting Changes
- Compare tax benefits
  - 2008 EPAct and 2009 ARRA
- Changes in Merchant modeling (Cash-Flow)



# Comparison to the 2007 IEPR

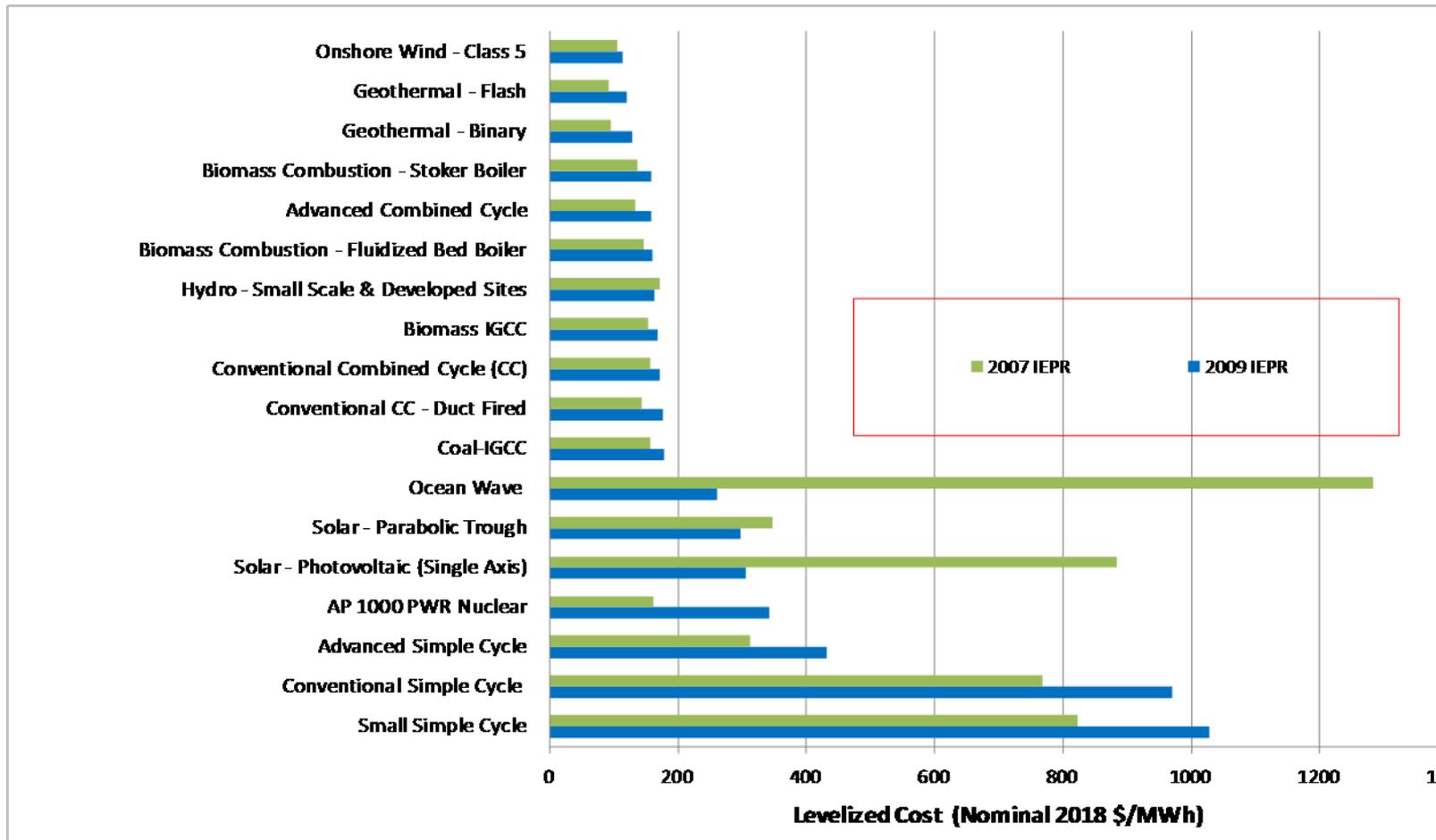
## Average Case – Start Year = 2009





# Comparison to 2007 IEPR

## Average Case – Start Year = 2018





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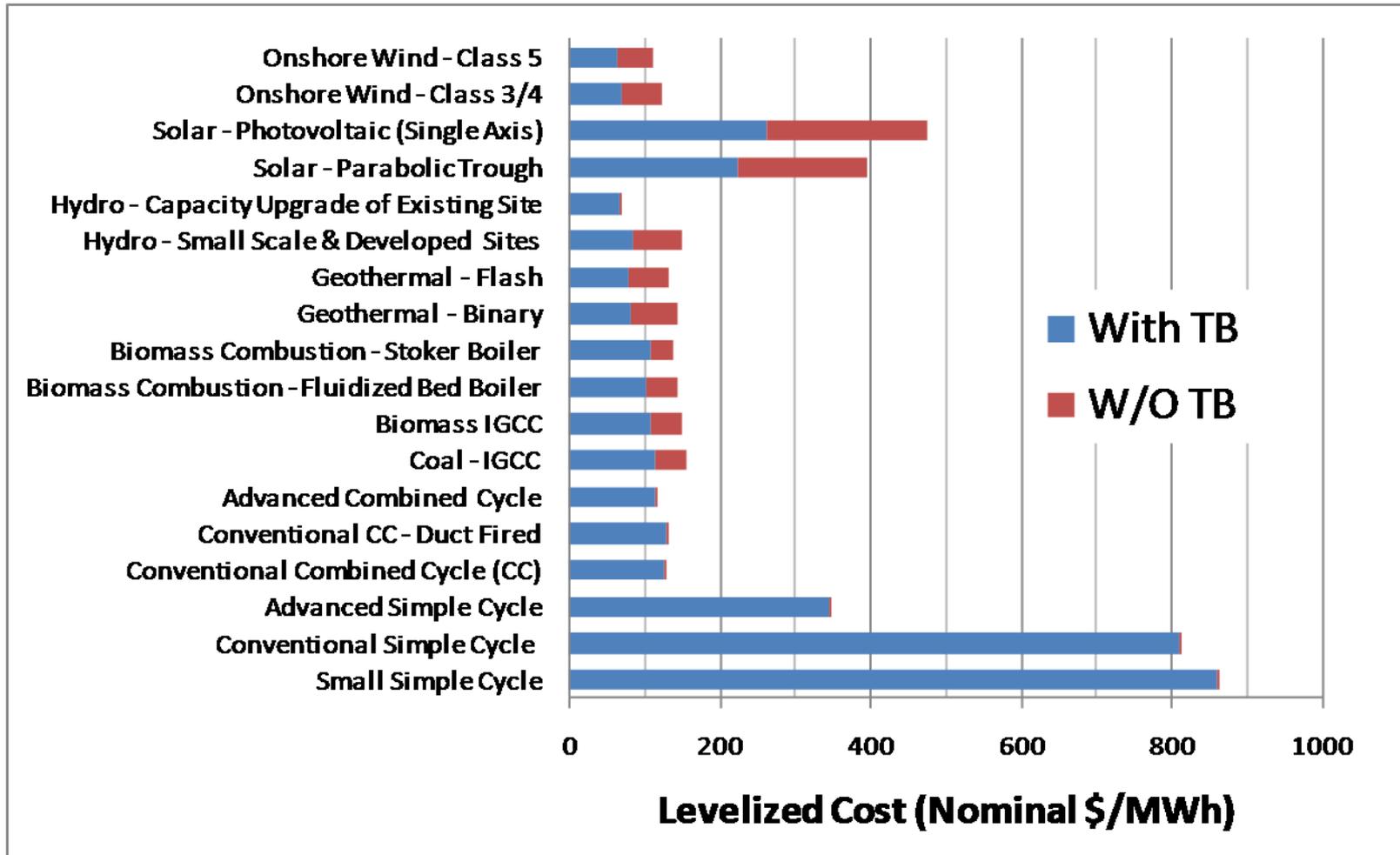


# TAX TREATMENT ISSUES

- Significant uncertainty should be included in policymakers' understanding of issues
  - Dependent on expected Congressional actions
- When do renewable tax credits sunset?
- Can renewable tax credits be recovered in a single year or over spread over multiple years?
- Model can measure importance of these choices

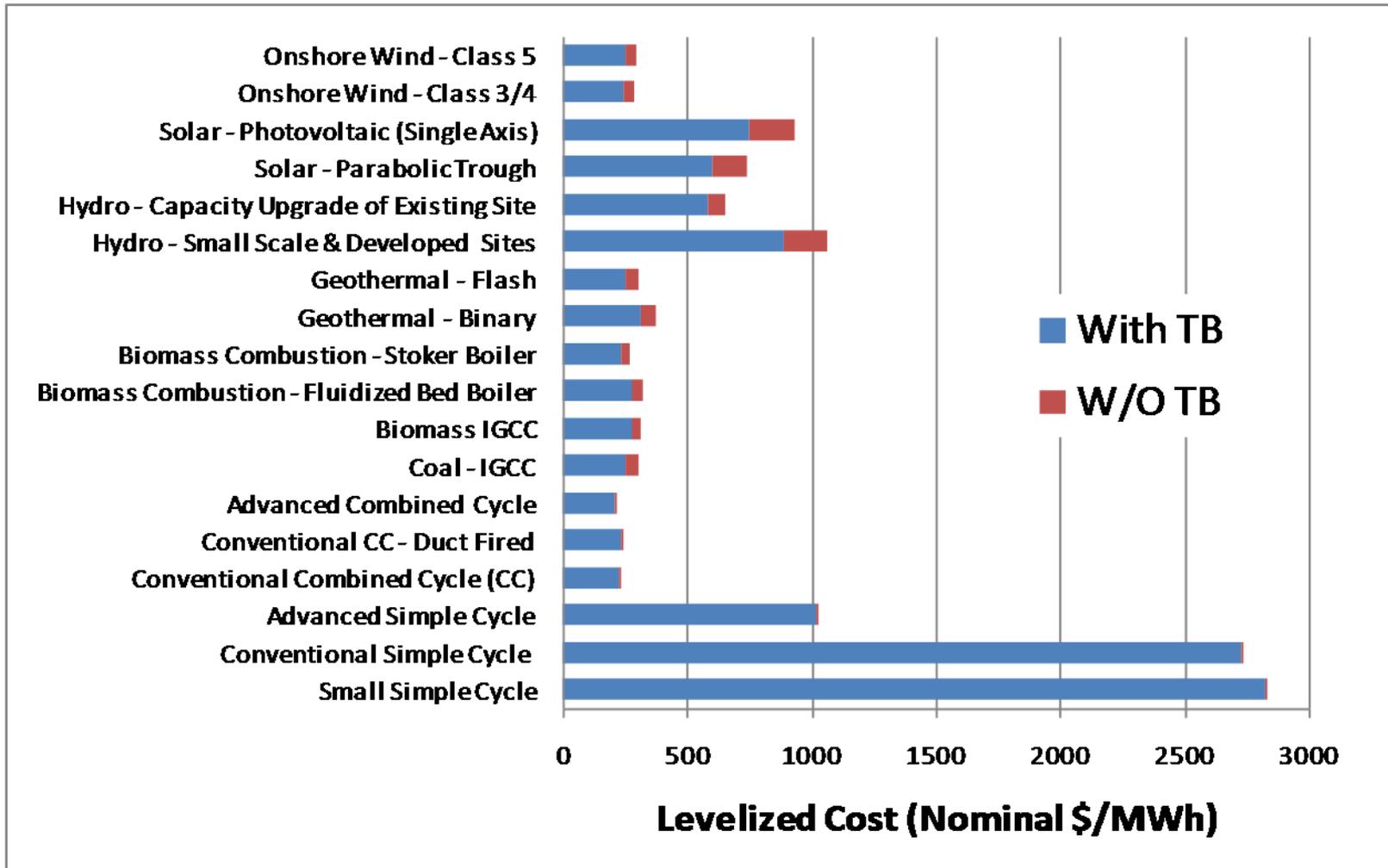


# Effect of Tax Benefits (TB) Average Case



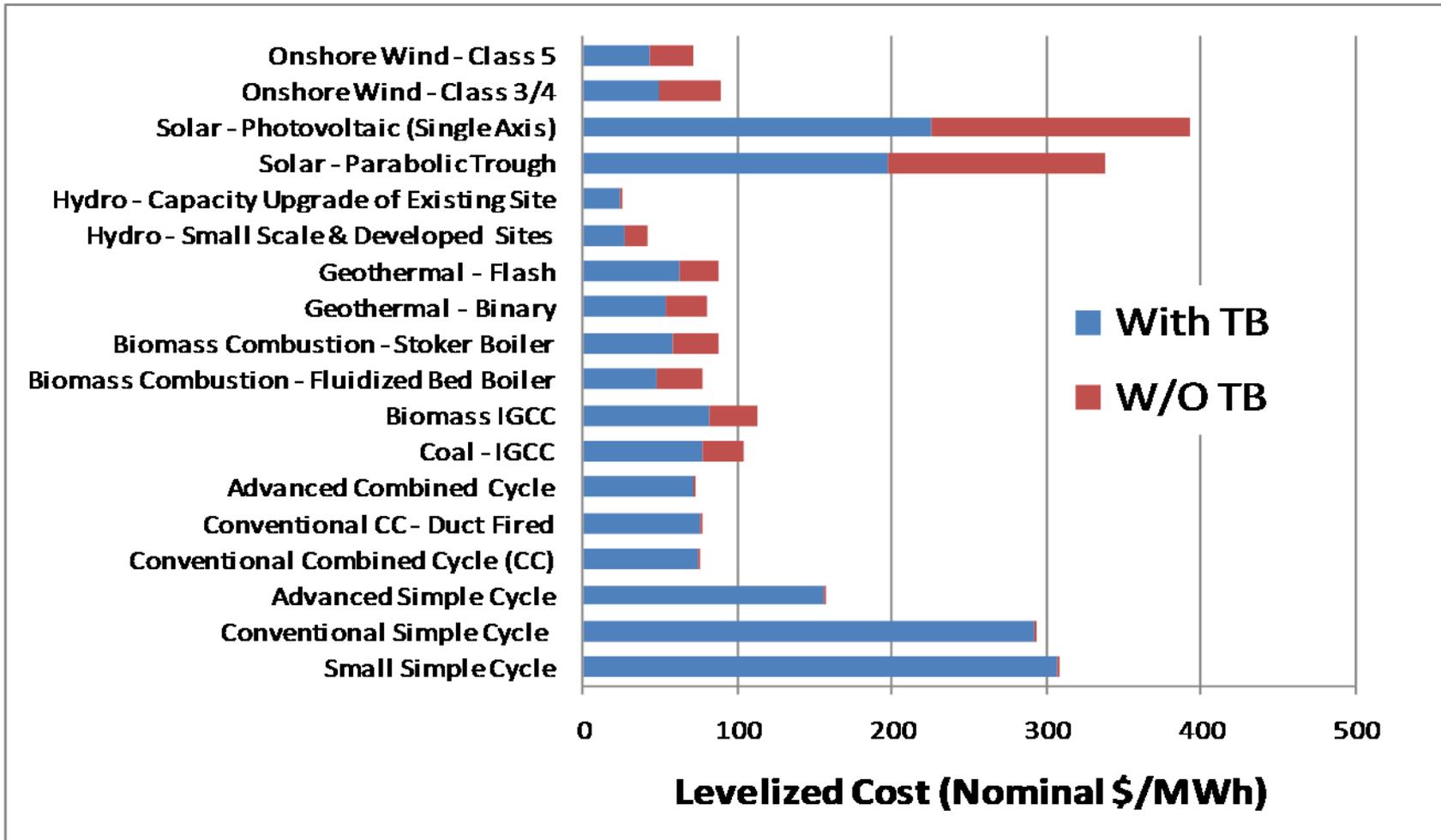


# Effect of Tax Benefits (TB) High Case



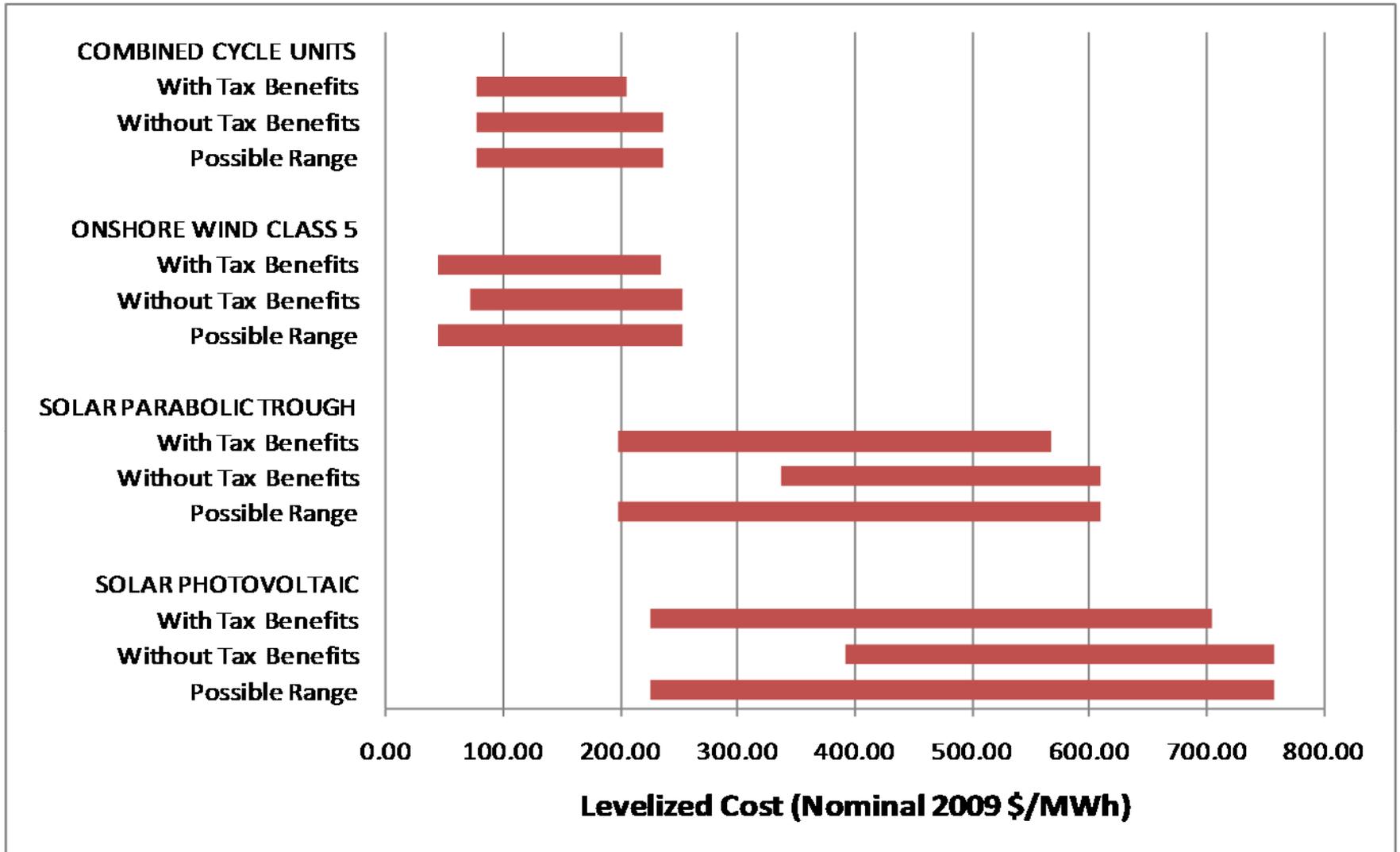


# Effect of Tax Benefits (TB) Low Case





# Maximum Possible Ranges





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# UNDERSTANDING THE MODEL RESULTS

- Levelized Costs are variable as evidenced by the high low and trend numbers/figures we have shown.
- System and technology interact to affect costs,
  - Can't know how the system will affect the operation of the technology.
    - Capacity factor is a good example.
  - Can't tell how technology will affect the system
    - Integration costs a key example



# MORE ON UNDERSTANDING THE MODEL RESULTS

- “*Location, location, location*” - transmission and interconnection costs highly variable and site specific
  - But generic regional assumptions required for planning
  - Ratemaking does NOT equal cost causation
- Costs do NOT equal prices!!!
  - Market contract terms will reflect conditions, such as floor imposed by RPS requirement
- Does NOT include benefits, emission effects, etc.
  - Can only be assessed with system modeling



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- Model Limitations
- **Workshop Questions**



# WORKSHOP QUESTIONS

- How are the COG Model and data useful to other agencies and stakeholders?
- How might the COG effort be revised to make it more useful?
- Do the technology levelized costs and assumptions appear to be reasonable?
- Are the tax and tax credit assumption reasonable?



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