Paving the path for South Africa's Energy Transition: Setting the Scene

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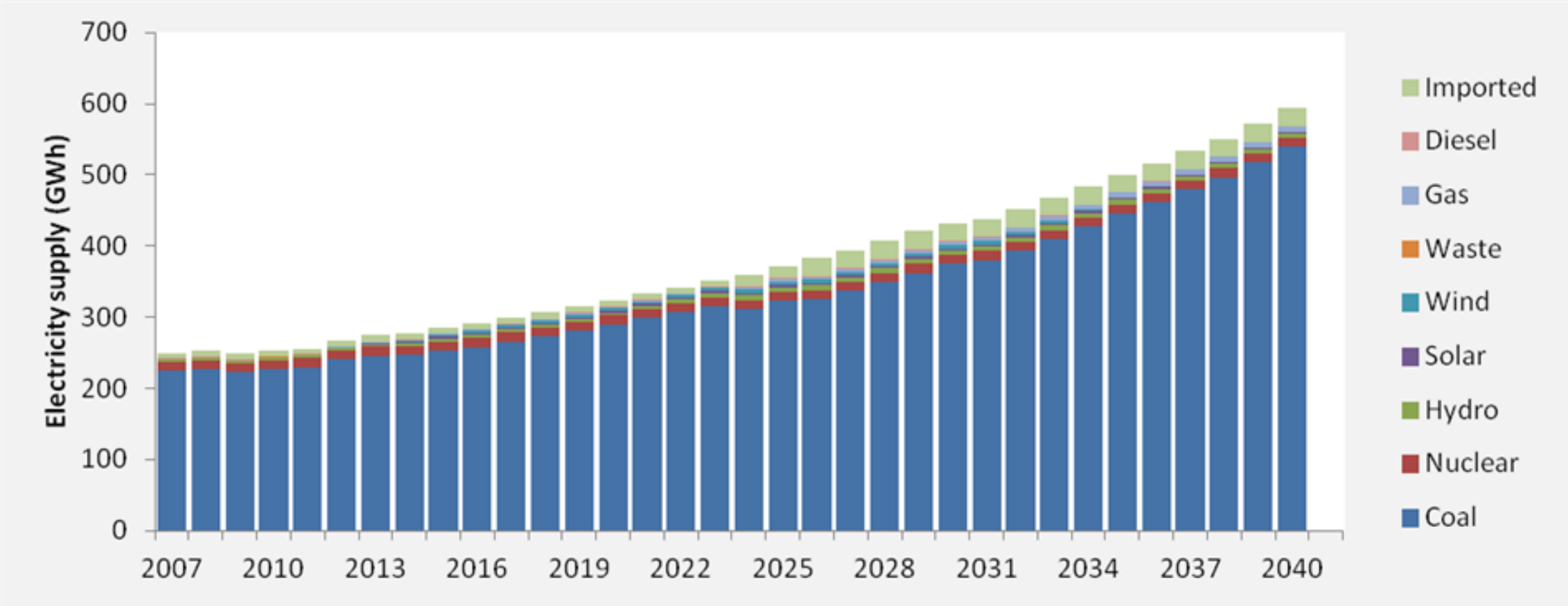
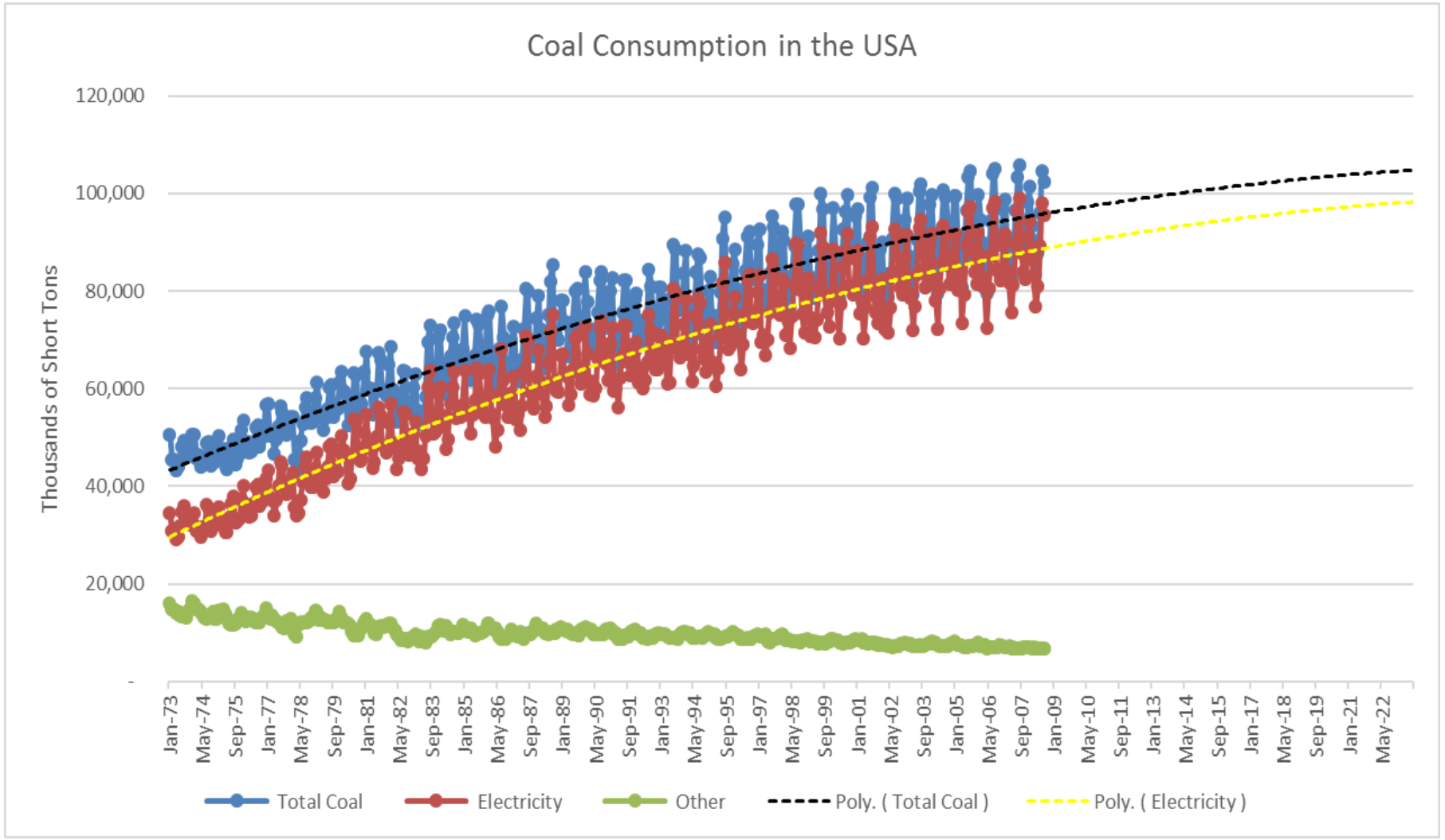
Internal Projections of electricity supply by source for South Africa developed around 2010 (standard least cost)

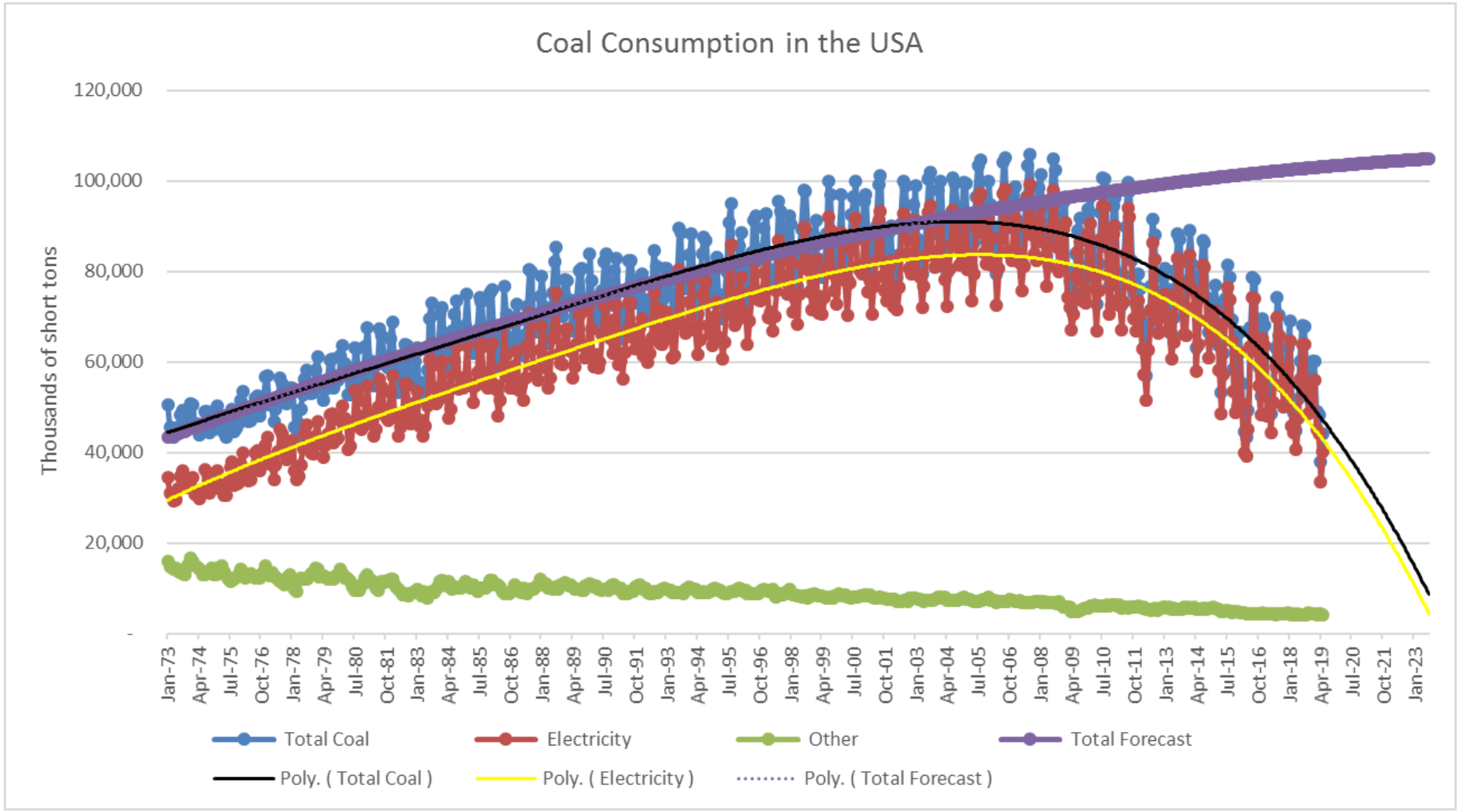


United States Monthly Coal Use



Source: U.S. Energy Information Administration. Electronic data from April 2018 Monthly Energy Review accessed on May 18, 2018.

United States Coal Use



Source: U.S. Energy Information Administration. Electronic data from Monthly Energy Review accessed August 27, 2019.

NREL: Updated Solar Generation Costs

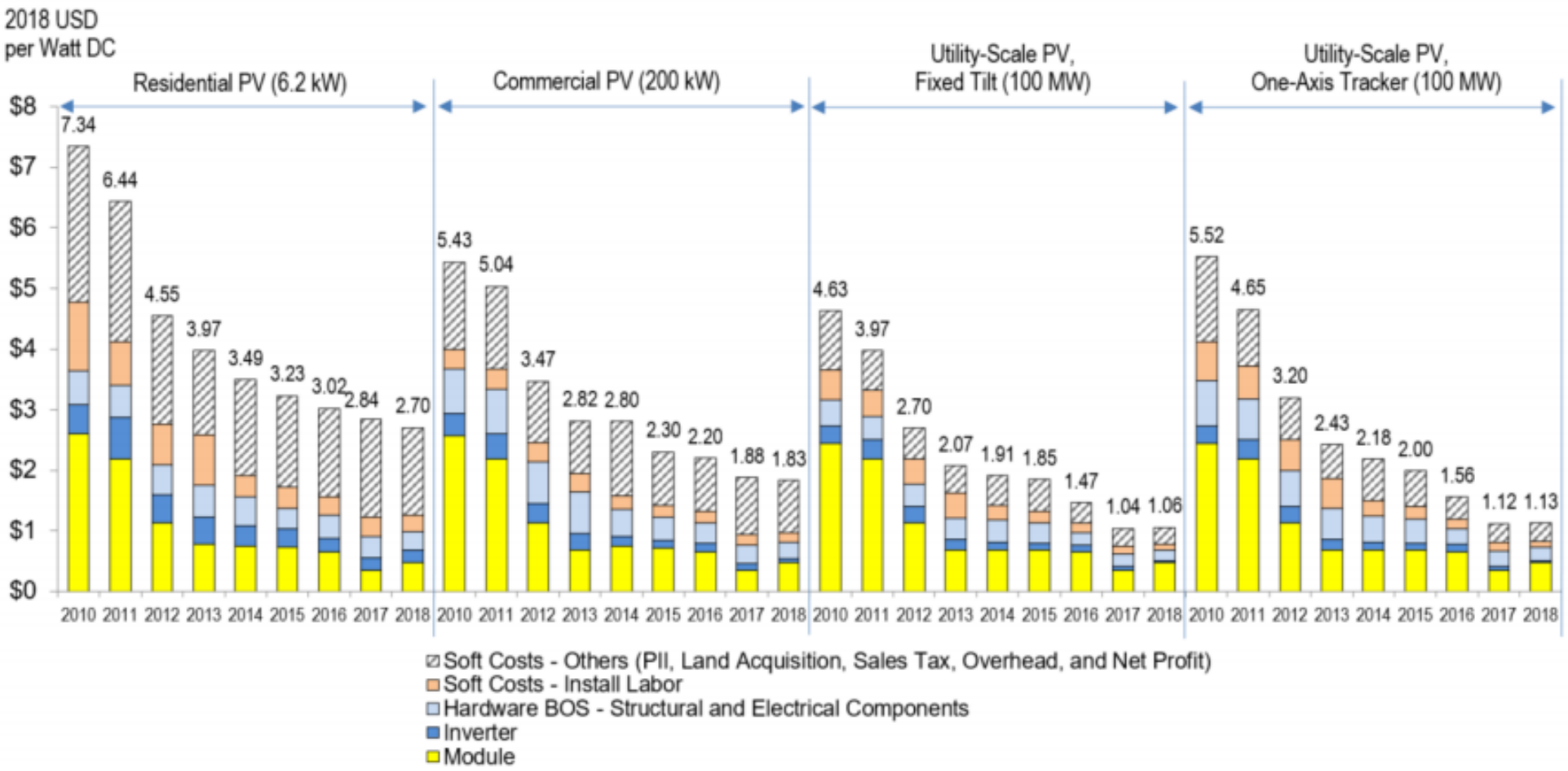


Figure ES-1. NREL PV system cost benchmark summary (inflation adjusted), 2010–2018

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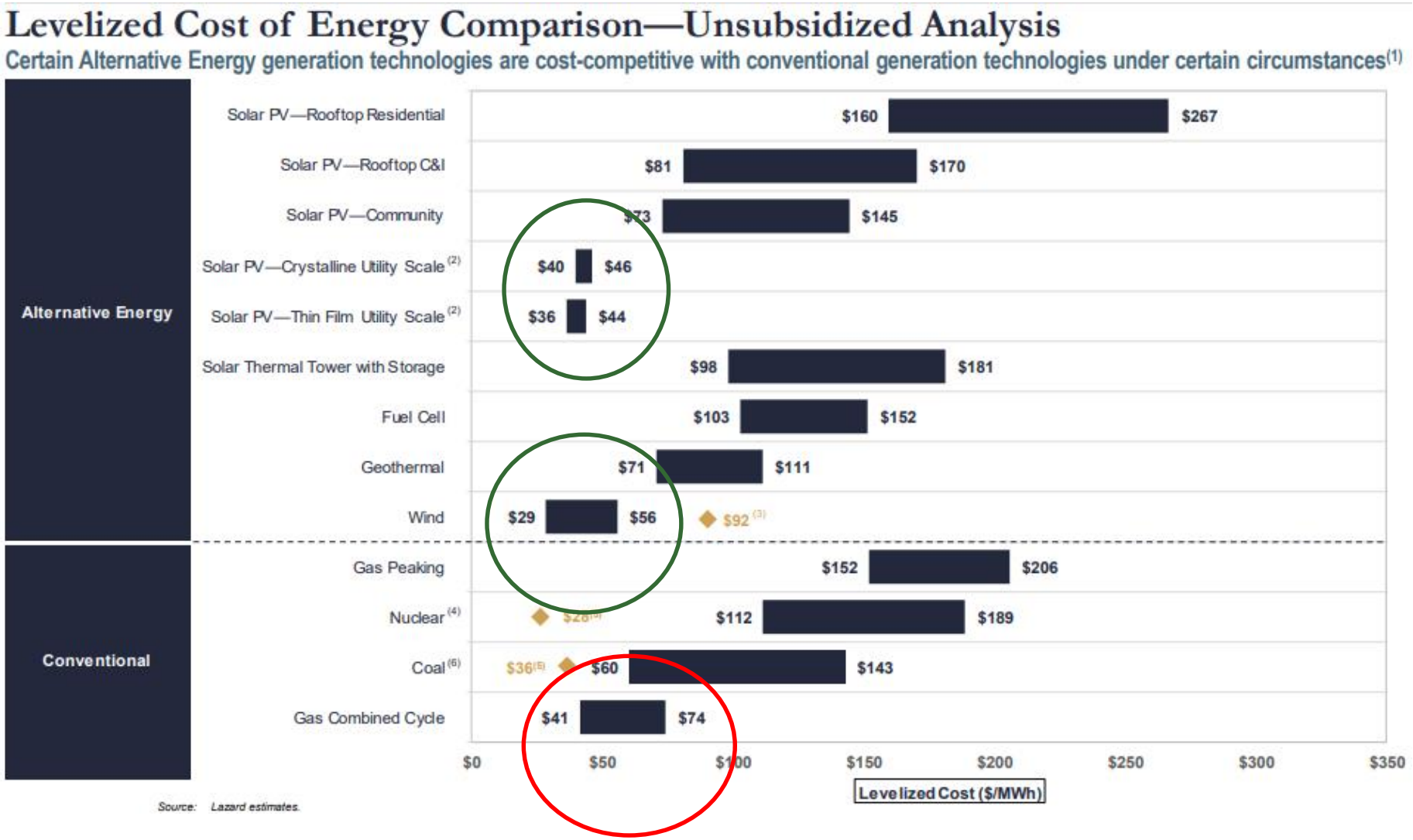
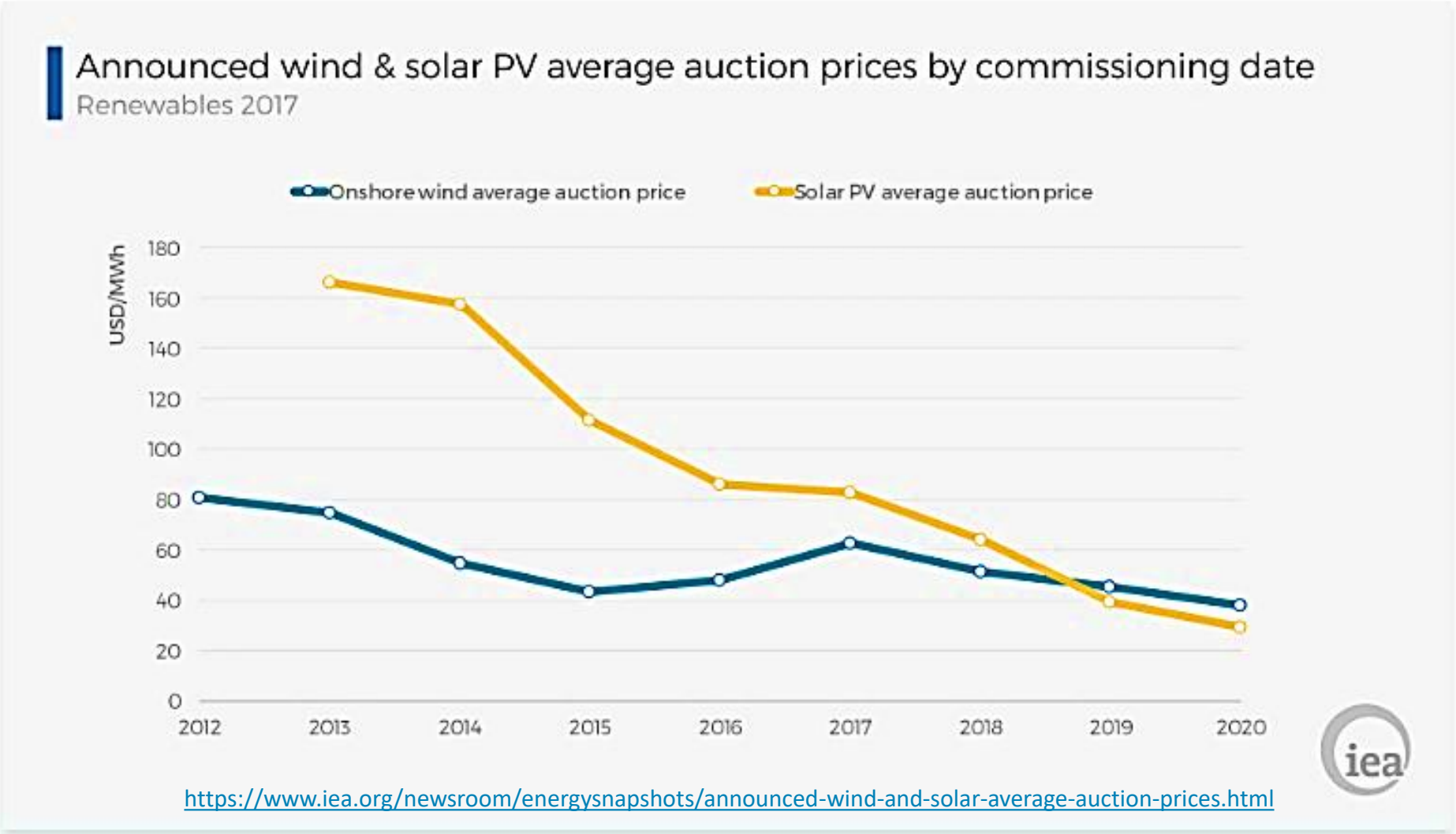
Levelized cost comparisons (2018) - *Lazard*



Cost of Renewable Electricity at Auctions



https://www.iea.org/newsroom/energysnapshots/announced-wind-and-solar-average-auction-prices.html

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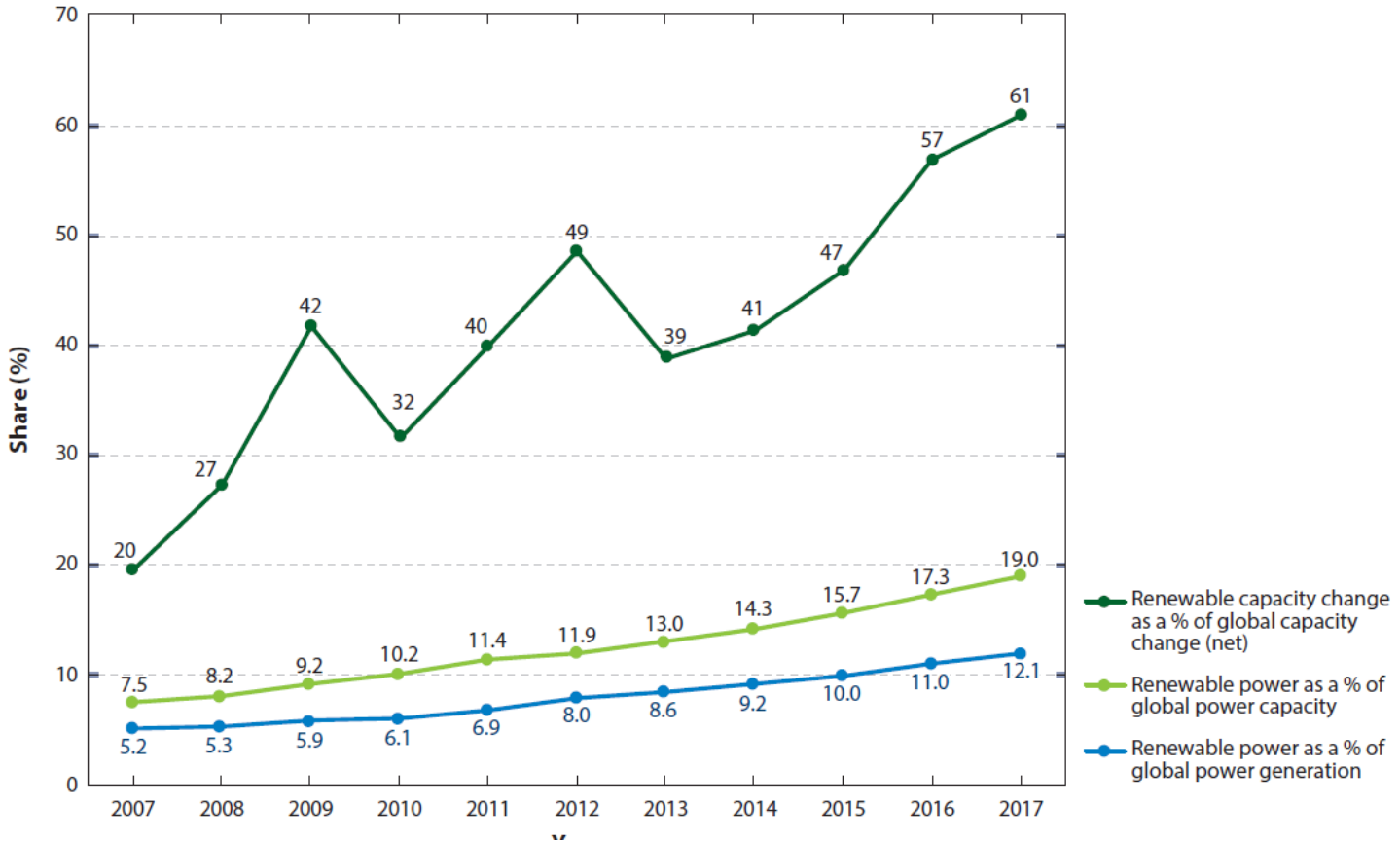
Global Response in Power Generation

- **Global investment in renewable energy in 2018 reached $289.1 billion.**



Source: http://fs-unep-centre.org/sites/default/files/publications/globaltrendsinrenewableenergyinvestment2018.pdf and https://www.ren21.net/wp-content/uploads/2019/05/gsr_2019_full_report_en.pdf

The Scene

- Rapid rates of technical of advance
  - Solar
  - Wind
  - Systems integration
- Cost levels of renewables, especially solar and wind, are clearly in competitive ranges.
  - Continued technical advance, which is expected, will place more renewables as least cost (subject to systems integration).
- Renewable generation share is becoming significant
  - Implications of the next two doublings of renewable power share much more profound than the previous two doublings.

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Look back: Lessons learned

- **Modeling and other analytical work has been extremely useful.**
- **Advanced understanding of:**
  - Energy endowments including wind and solar
  - Generation technology options
  - Systems integration challenges/possibilities
- **We should expect ongoing change, both unfolding on the ground, and in our perspectives of the future.**

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Reference

- "Faster than you think: The renewable energy revolution and developing countries." *Annual Review of Resource Economics* 2019: 11(17): 1-20.
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