

# The 2050 Energy/Climate Challenge

Henry D. Jacoby

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# The Message

There are issues that will be important in 2050 (and beyond) that need more attention now.

# Forecasting: 32 Years Ago

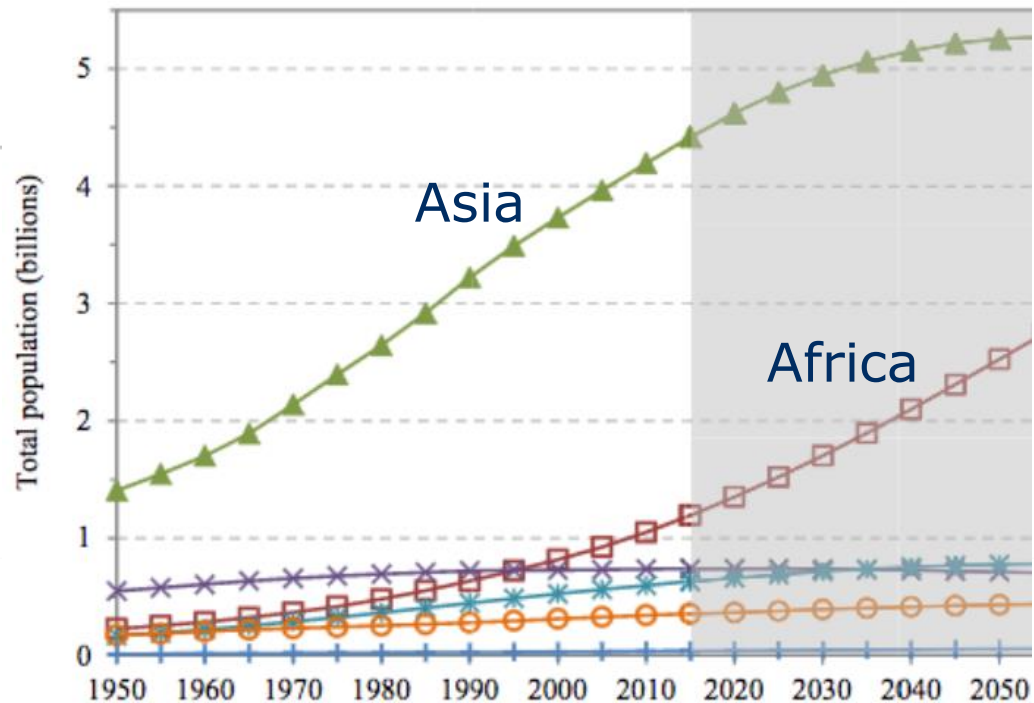
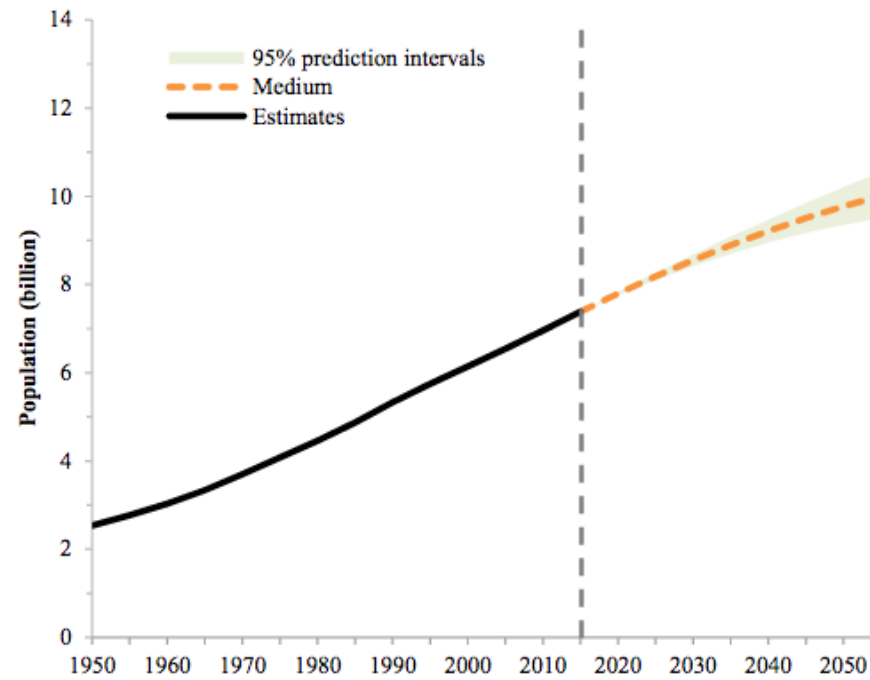
## US Oil Production



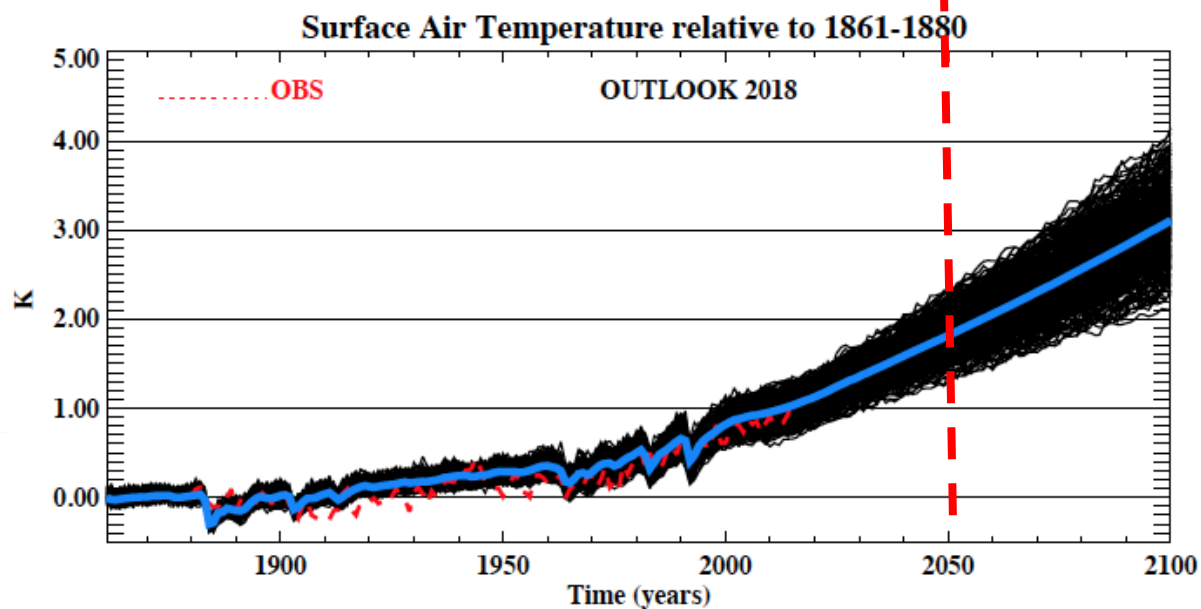
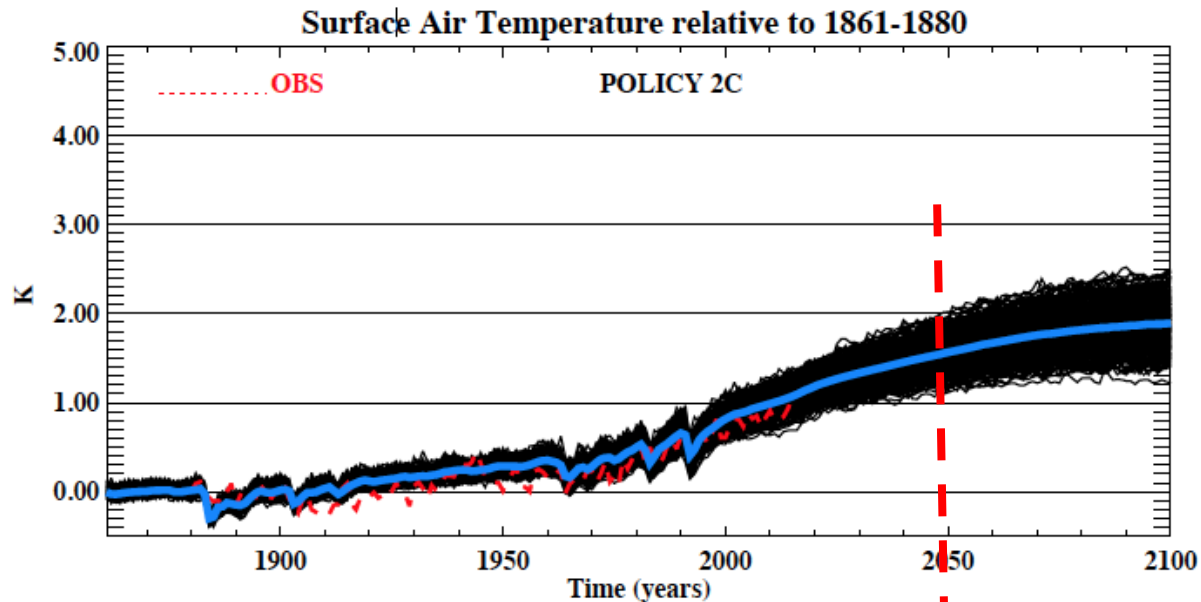
# Model Results to Illustrate

- MIT EPPA and IGSM
  - 2018 Outlook (in process)  
(similar to IEA WEO New Policies)
  - 2°C scenario
- IEA WEO Sustainable Development
  - 2°C Scenario
  - Other objectives
- Shell “Sky”
  - 2°C Scenario

# Inertia: Population

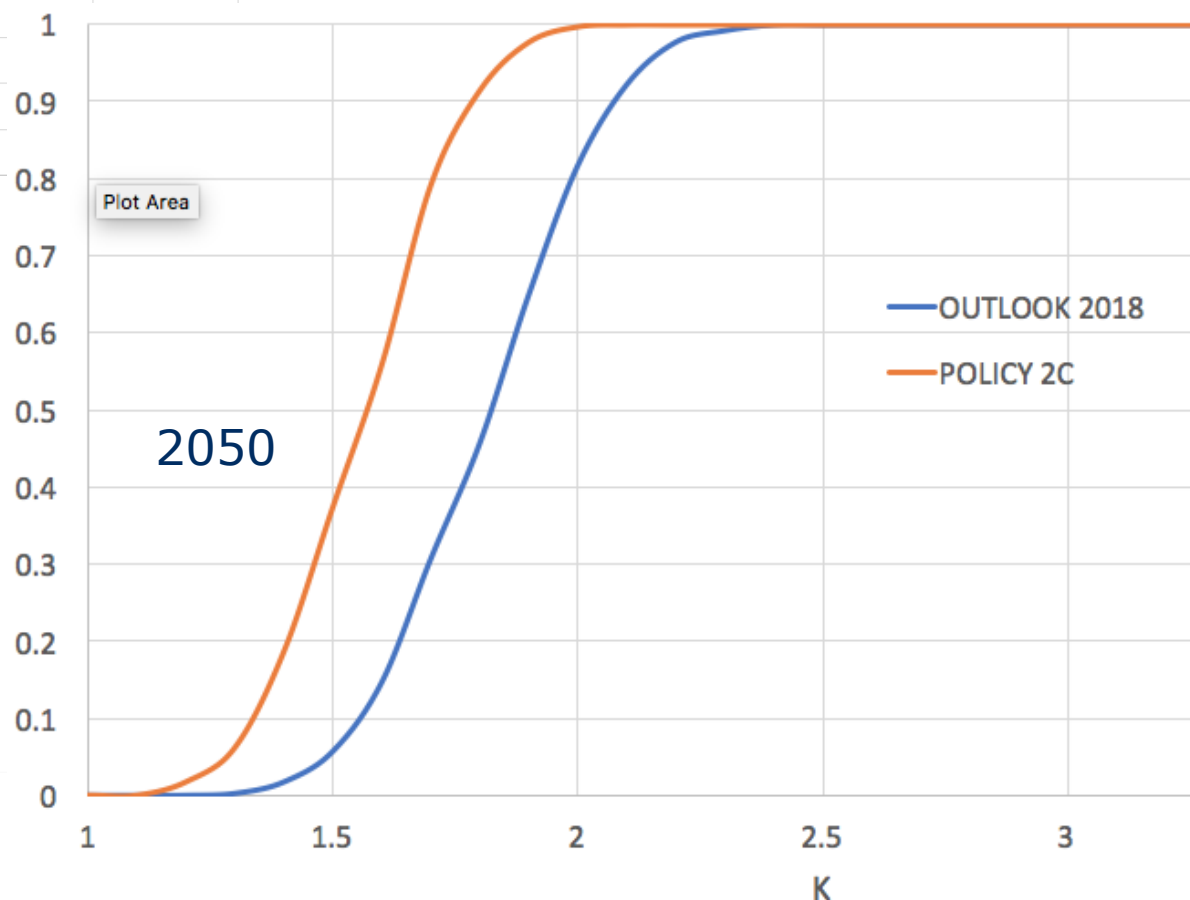
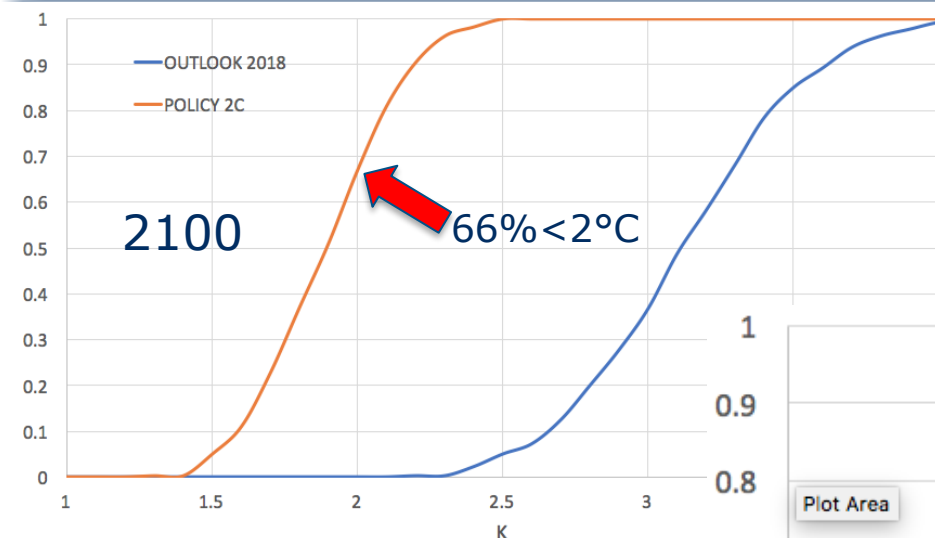


# Inertia: Climate

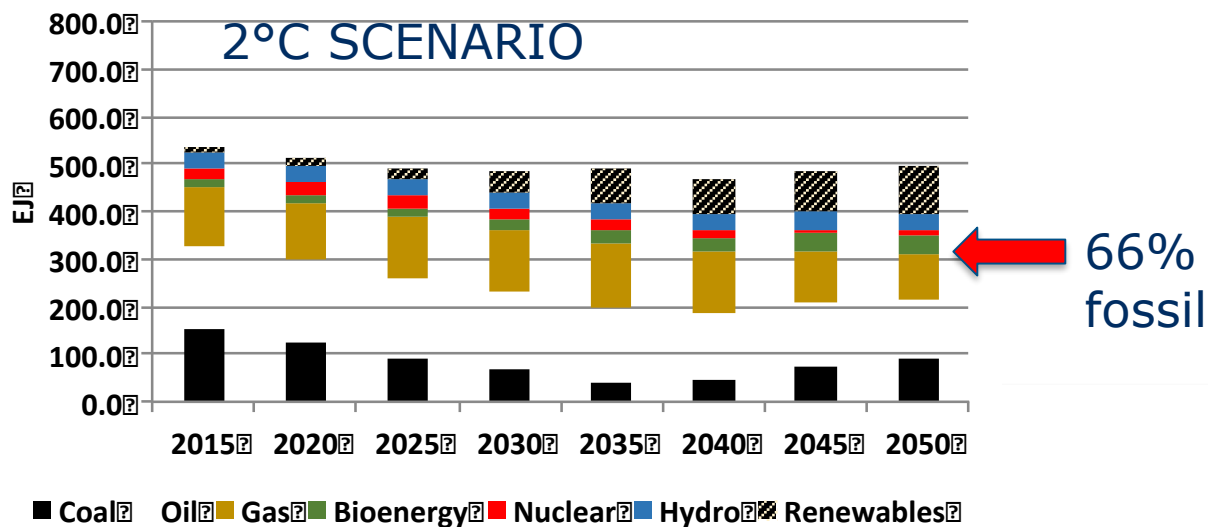
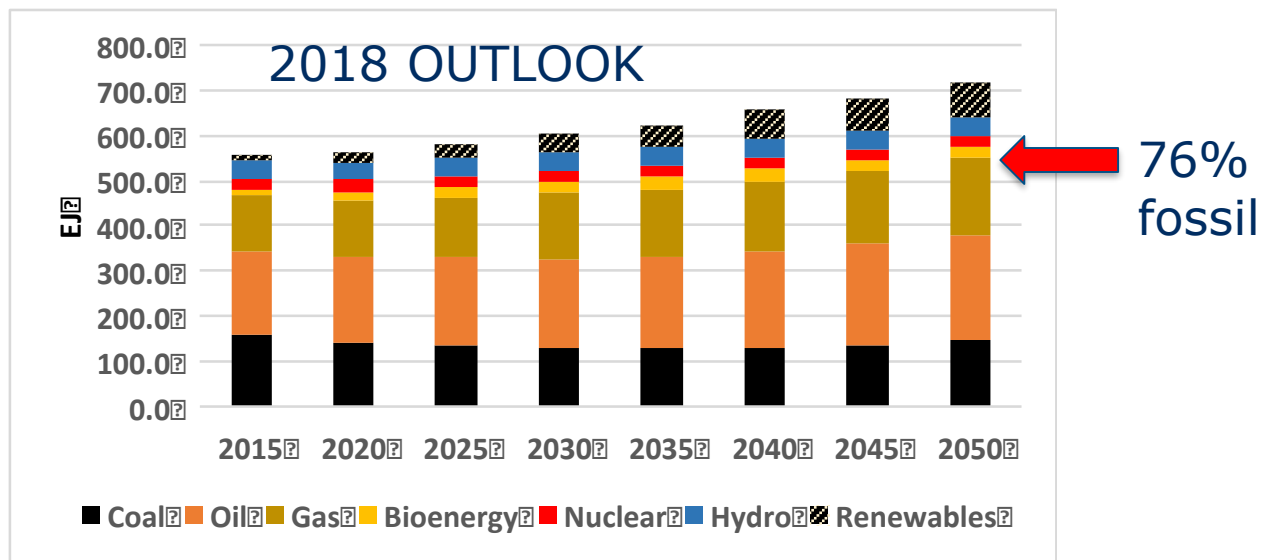


# Inertia: Climate

Probability of air temperature staying below given value, relative to 1961-80 mean, conditioned on emissions scenario

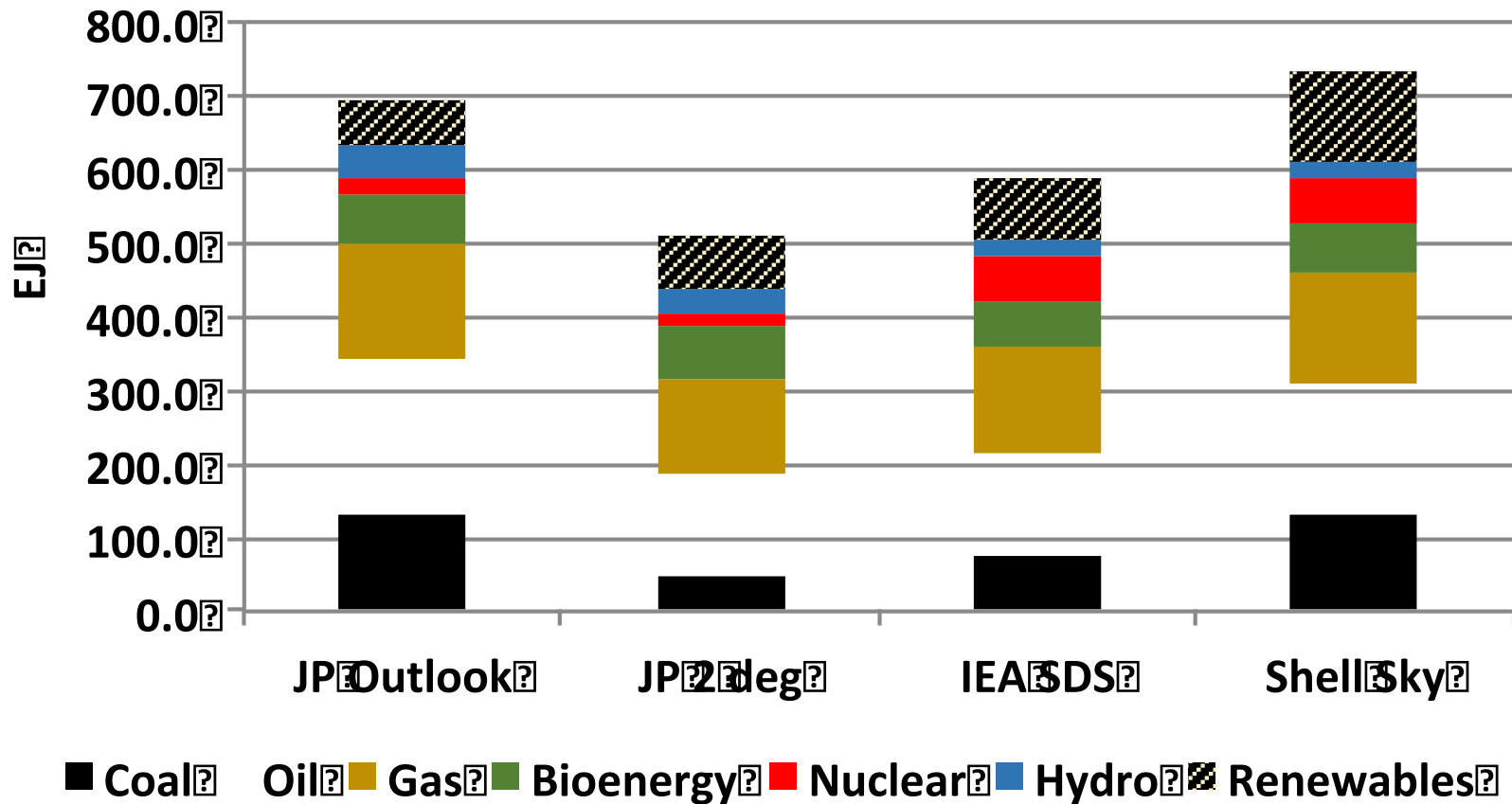


# Inertia: Primary Energy

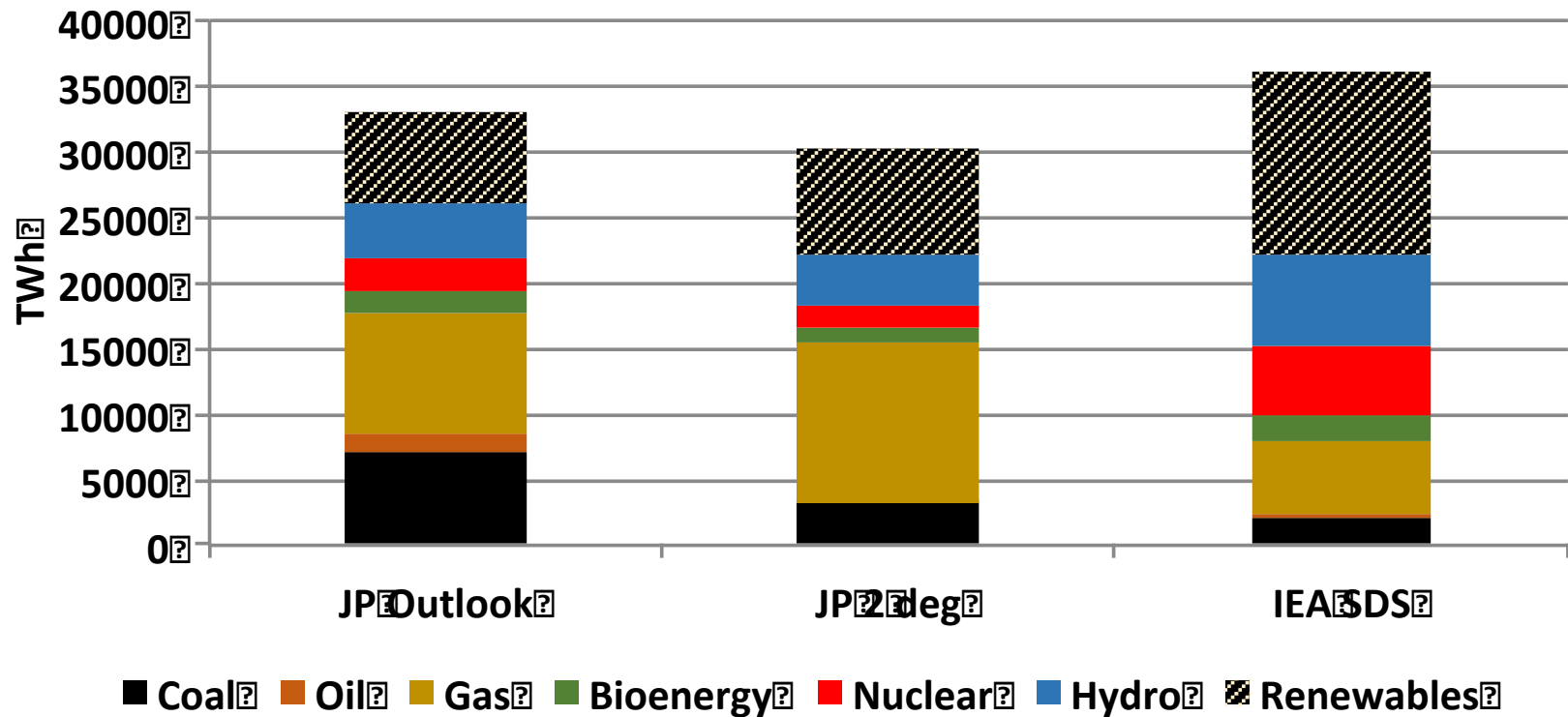




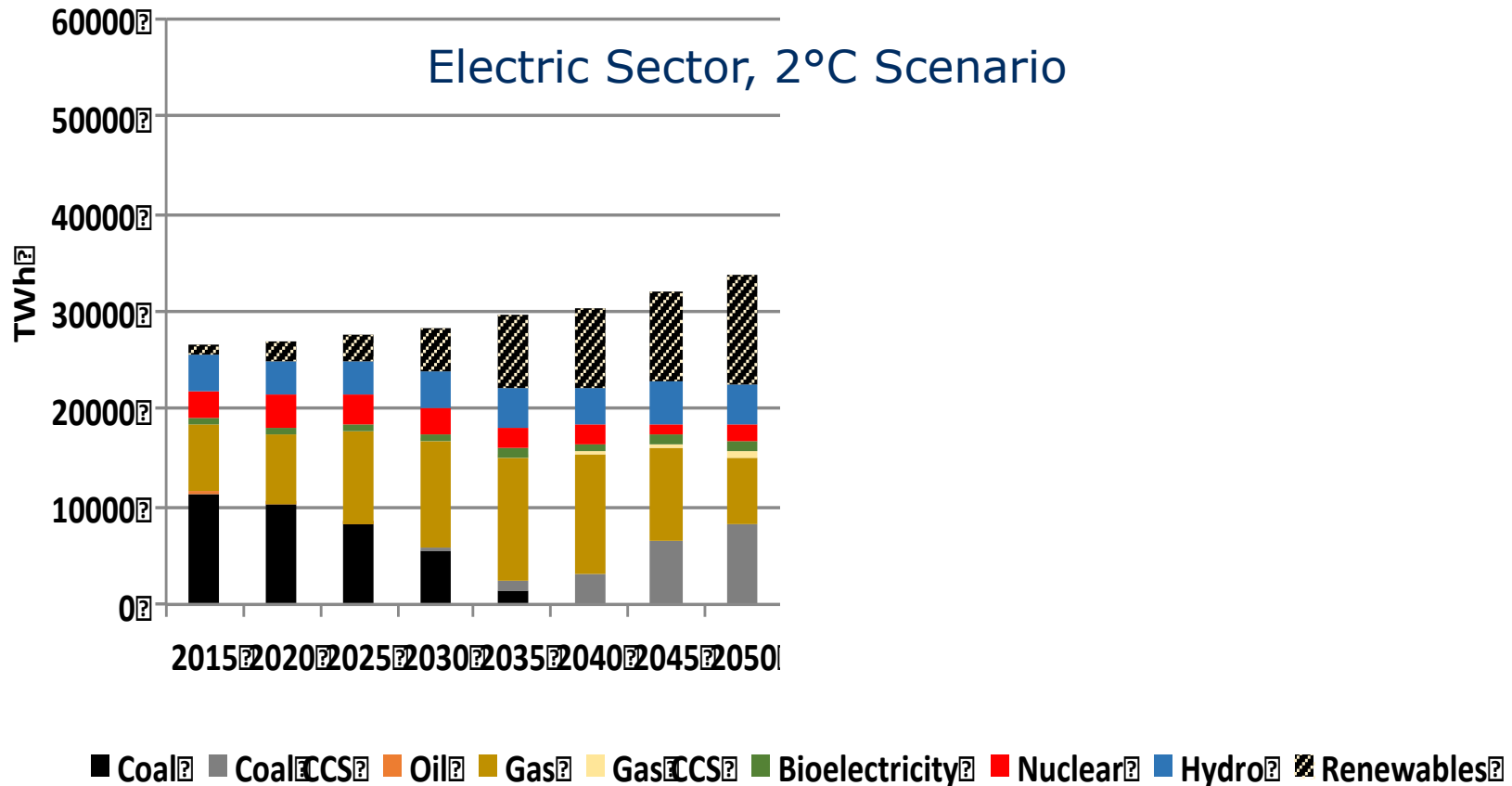
# Primary Energy in 2040



# Electric Sector in 2040



# But . . . Preparing for What Comes After?



# Evidence: Response to Paris Article 4, ¶9

“All parties . . . communicate long term low greenhouse gas emissions development strategies”

- 8 to 10 now on FCCC website
  - Mainly mid-century strategies
  - Diverse approaches, mainly model studies
  - Provide insight, but . . .
- Many lack links to near-term effort
  - Not see NDC as first step in LT strategy
  - “not blueprints for action” or “not intended to define concrete near-term activities”

# Near-Term Actions (Not for Current NDC)

- R&D and demonstration
- Others implied by the transition, with long times to fruition
- Differ by country . . . but e.g.,
  - Emissions pricing regimes
  - Foster public acceptance of needed technologies
  - Prepare to manage stranded assets
- Short/long-term integration will
  - Add credibility to objectives/vision
  - Increase confidence in Paris regime

# An Incautious Forecast: in 2050

- Some version of the Paris pledge-&-review regime is still in effect, and
  - Climate has greater political salience, but
  - Confounding international stresses remain
- Global emissions are somewhere between our Outlook and 2°C paths
- Preparation for the more wrenching transition to come is incomplete

Anchor long-term strategies in  
near-term actions

# Thank You!