

Exploring the sensitivity of a TIMES-based electricity sector model to different choices of regional aggregation



For

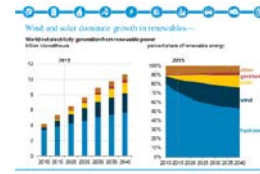
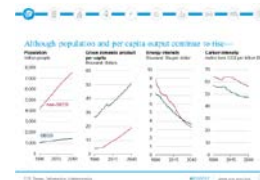
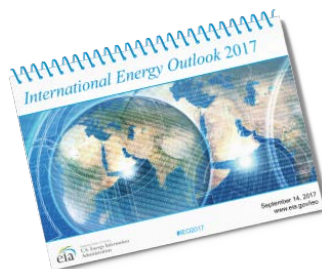
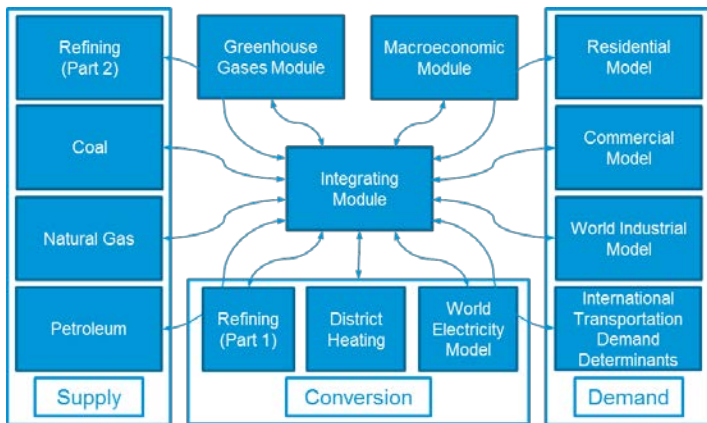
International Energy Workshop

June 20, 2018 | Gothenburg, Sweden

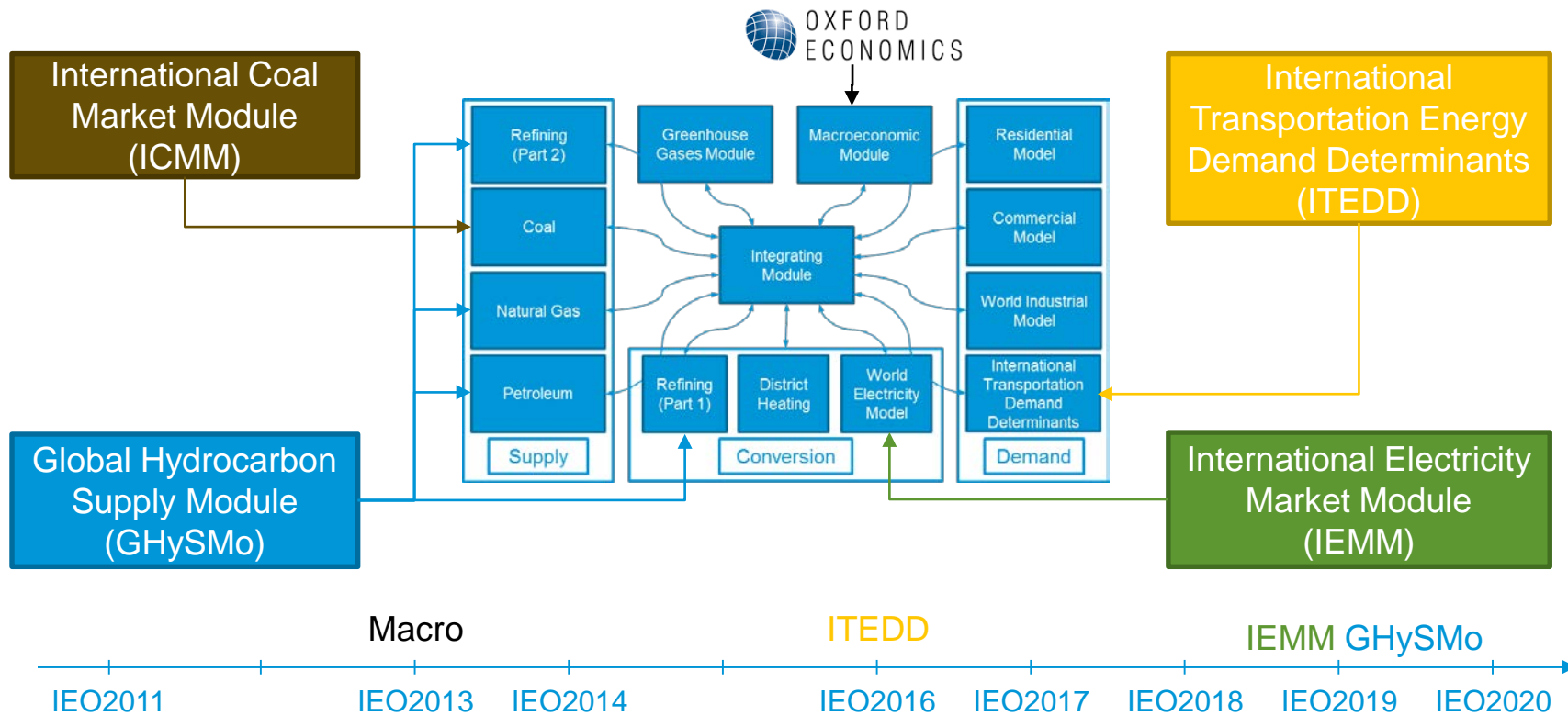
By

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The World Energy Projection System (WEPS) is the model used for EIA's International Energy Outlook (IEO)

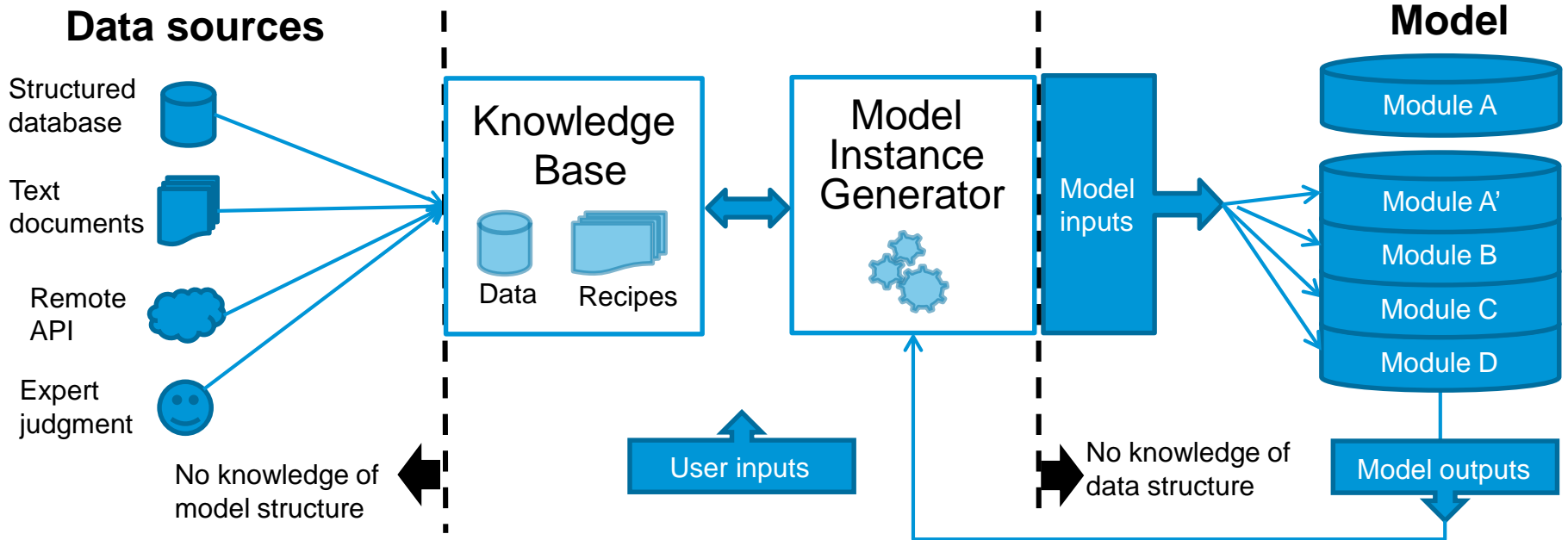


The International Electricity Market Module (IEMM) is a new WEPS module, to be introduced in IEO2019



IEMM takes a Knowledge-Based Modeling approach...

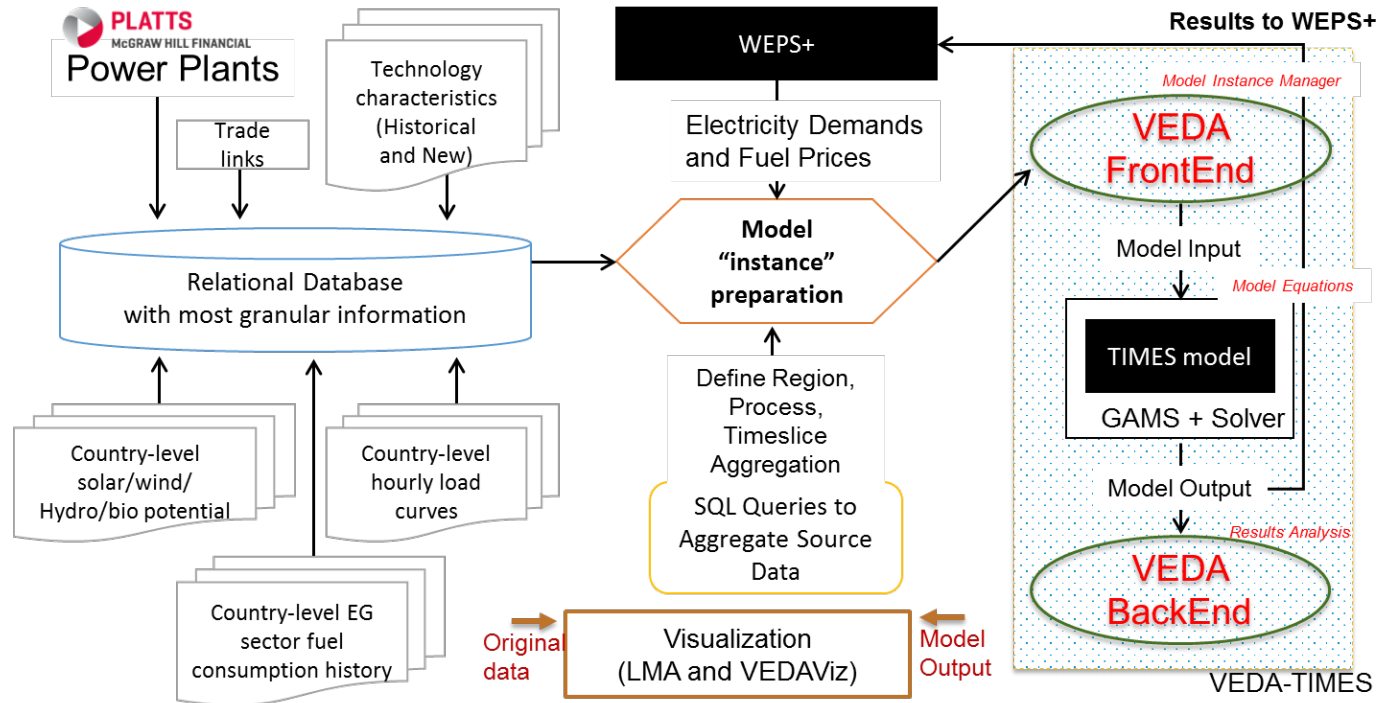
New strategy behind IEMM: Knowledge-Based Modeling (KBM) – separates data from solution algorithms



Note: Example information flows

...using TIMES as its modeling platform

KBM implementation for IEMM

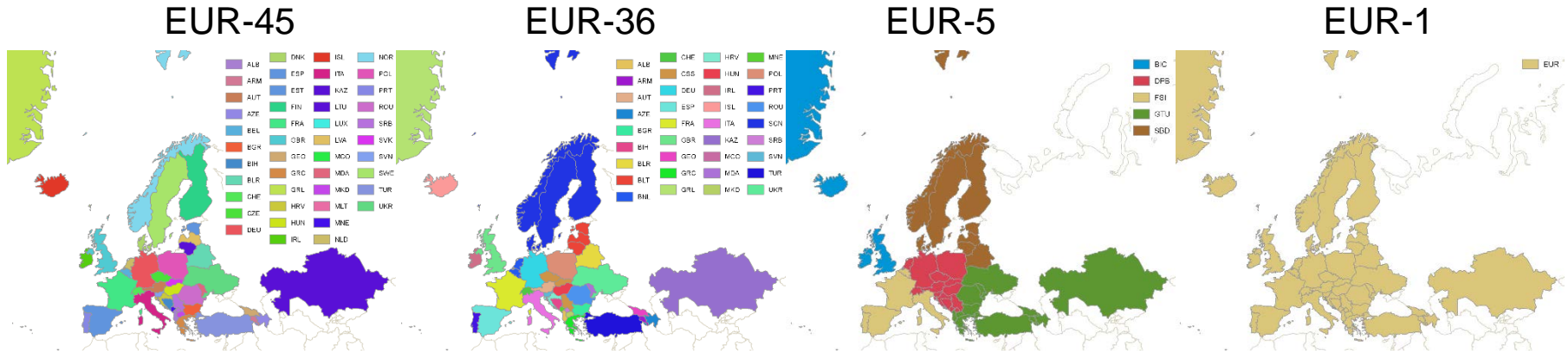


Research Question

Research question: How can one characterize the uncertainty in model results associated with the choice of geographic regionality?

Caveat: Results presented in this analysis are preliminary research results and do not reflect official EIA statistics

This analysis considers “Europe” at four levels of geographic aggregation



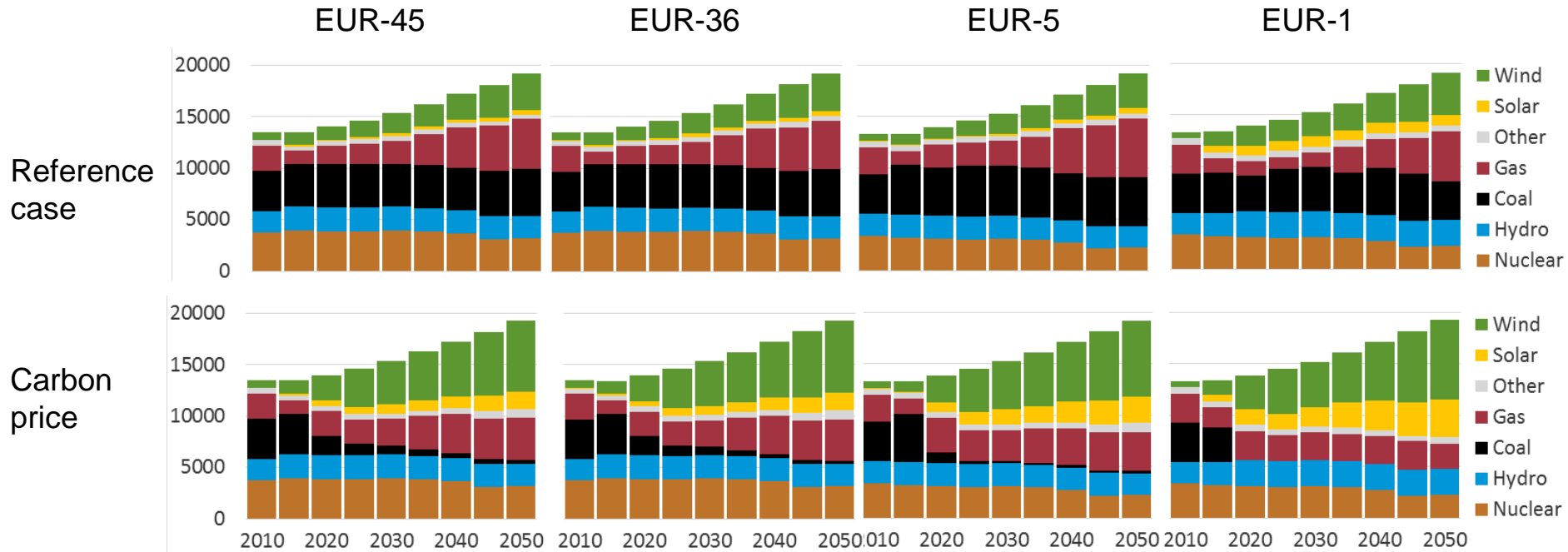
Hypothesis: Lack of internal structure (i.e., transmission constraints) will allow unrealistic high levels of intermittent renewable capacity at coarser regionalities

Total of 8 IEMM runs were made

- Common to all runs
 - Fixed demands
 - Fixed fuel prices
- Differences across runs
 - Geographic regions: EUR-45, EUR-36, EUR-5, EUR-1
 - Carbon price: either \$0/ton – or – \$50/ton in 2020 + 3%/year real (2015\$)
- Results aggregated to top level for ease of comparison

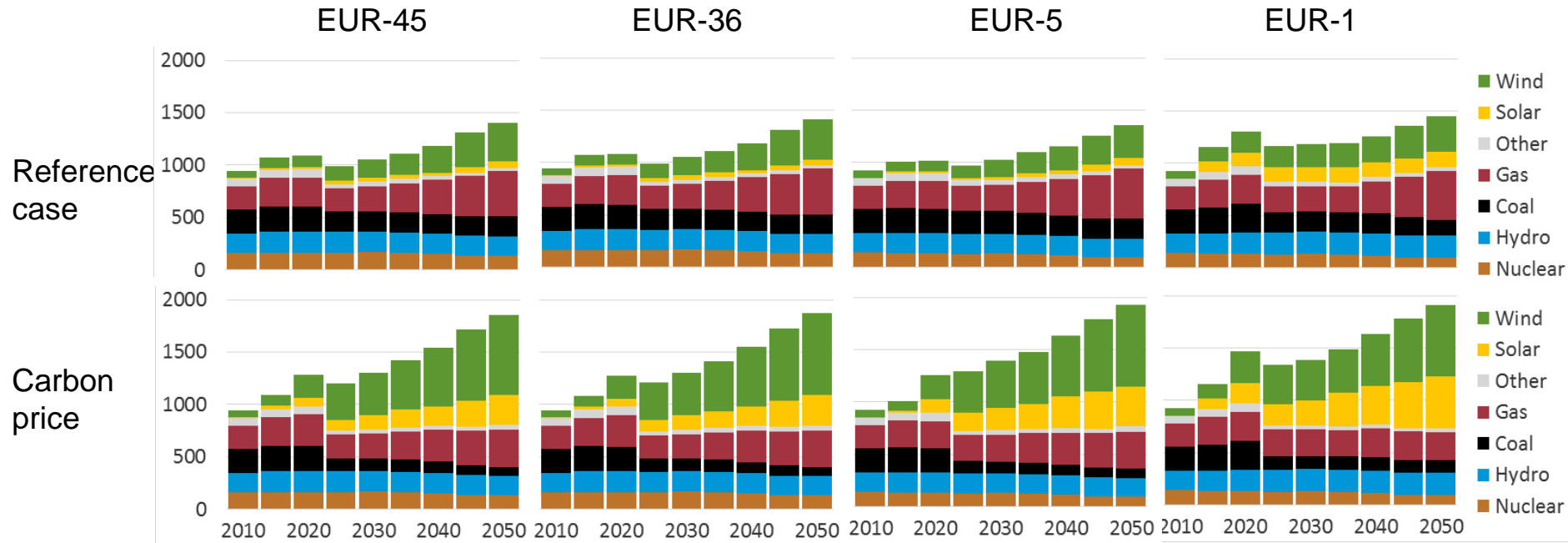
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Results: Electricity generation



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Results: Electric generating capacity



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For more information

U.S. Energy Information Administration (EIA) | <https://www.eia.gov/>

EIA Outlooks | <https://www.eia.gov/analysis/projection-data.php>

International Energy Outlook (IEO) | <https://www.eia.gov/outlooks/ieo/>

World Energy Projection System (WEPS) |
<https://www.eia.gov/outlooks/ieo/weps/documentation/>

International Electricity Market Model (IEMM) |
<https://www.eia.gov/outlooks/documentation/workshops/>