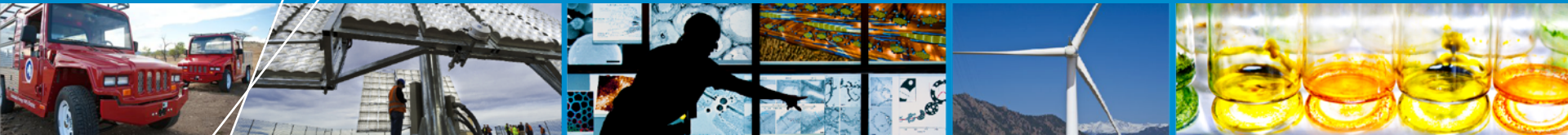


Sustainable Growth Working Group Under the Indo-US Energy Dialogue



Energy Water Modeling

Presented at the Joint Global Change
Research Institute Annual Integrated
Assessment Workshop

October 12th, 2016

Sustainable Growth Working Group (SGWVG) Multi-Model Analysis

- The SGWVG is a forum to share knowledge and expertise, methods and approaches, tools, best practices, and analyses to support sustainable growth.
- Under the SGWVG, U.S. and Indian research institutes are collaborating on research and knowledge-sharing across key sustainable development research topics.
- The SGWVG is led by NITI Aayog and USAID.

SGWG Focal Areas

- Energy data management
- Energy modeling
- Geospatial analysis of renewable energy options

Energy Modeling

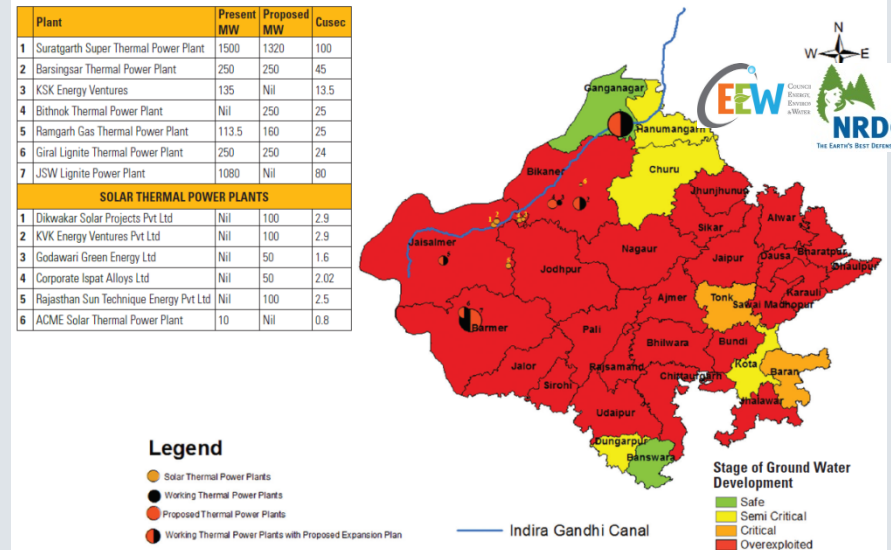
- Modeling of key topics:
 - Water scarcity risk and the energy-water nexus
 - Transport/air quality

- Multiple teams, complementary models

- Impact of EWN analysis:

- ✓ Understanding water supplies and potential future demands across different sectors will support planning
- ✓ Understanding the linkage between water scarcity, climate change, and mitigation or other Indian policy efforts will support effective policy development

Example: Power plants and ground water availability stress in Rajasthan



Modeling teams

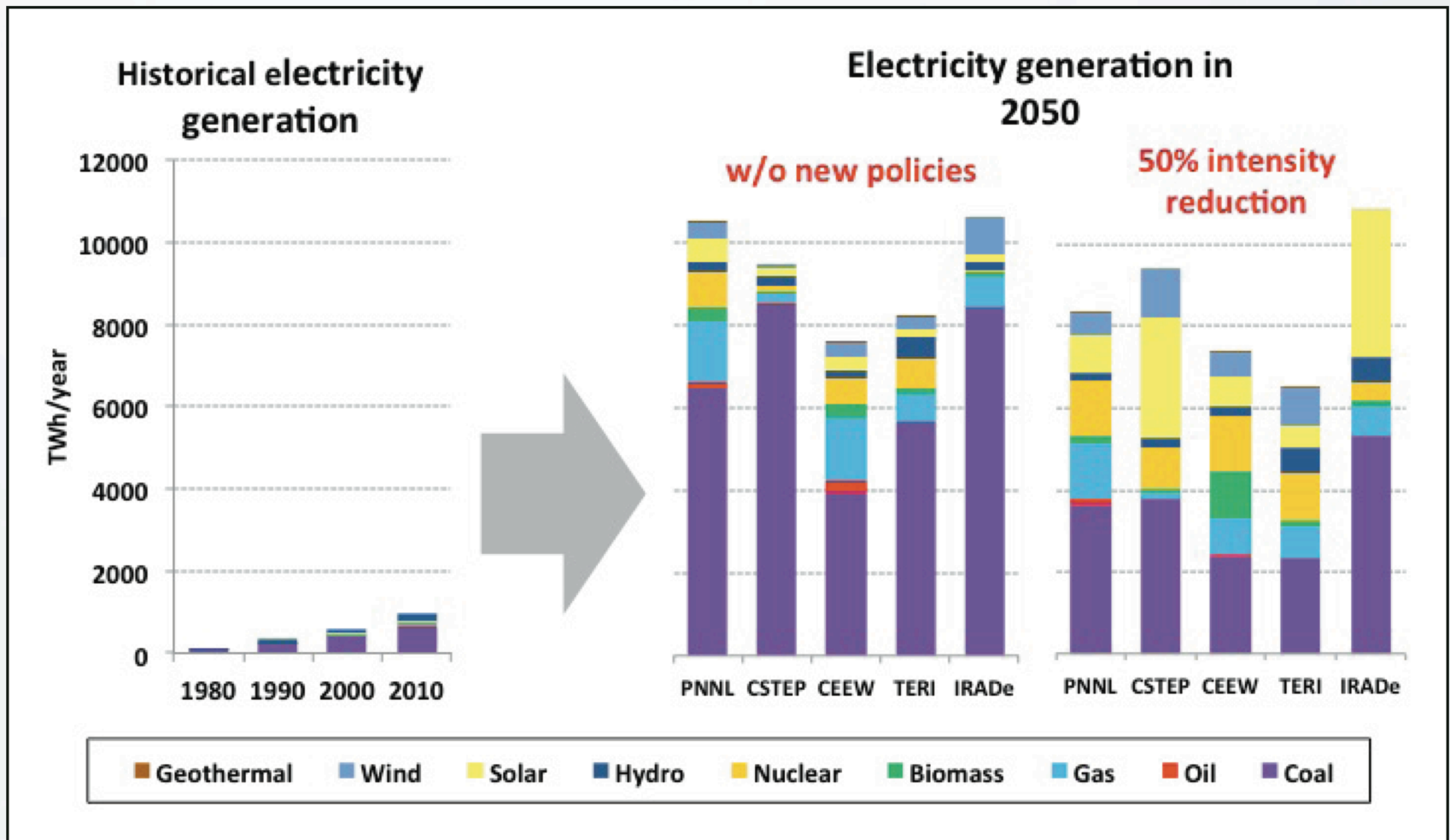


Model	Capabilities
TERI-MARKAL	<ul style="list-style-type: none"> • a customized version of MARKAL • energy system analysis • bottom-up optimization
LCSIG	<ul style="list-style-type: none"> • framework of activity analysis • linkages between the national economy and environment
GCAM-IIM	<ul style="list-style-type: none"> • a customized version of GCAM • different GDP and population assumptions • more disaggregated buildings sector
IMRT	<ul style="list-style-type: none"> • 5-region TIMES model of the Indian power sector
GCAM	<ul style="list-style-type: none"> • an integrated assessment model • a dynamic-recursive model with technology-rich representations of economic, energy, land-use, water and climate systems



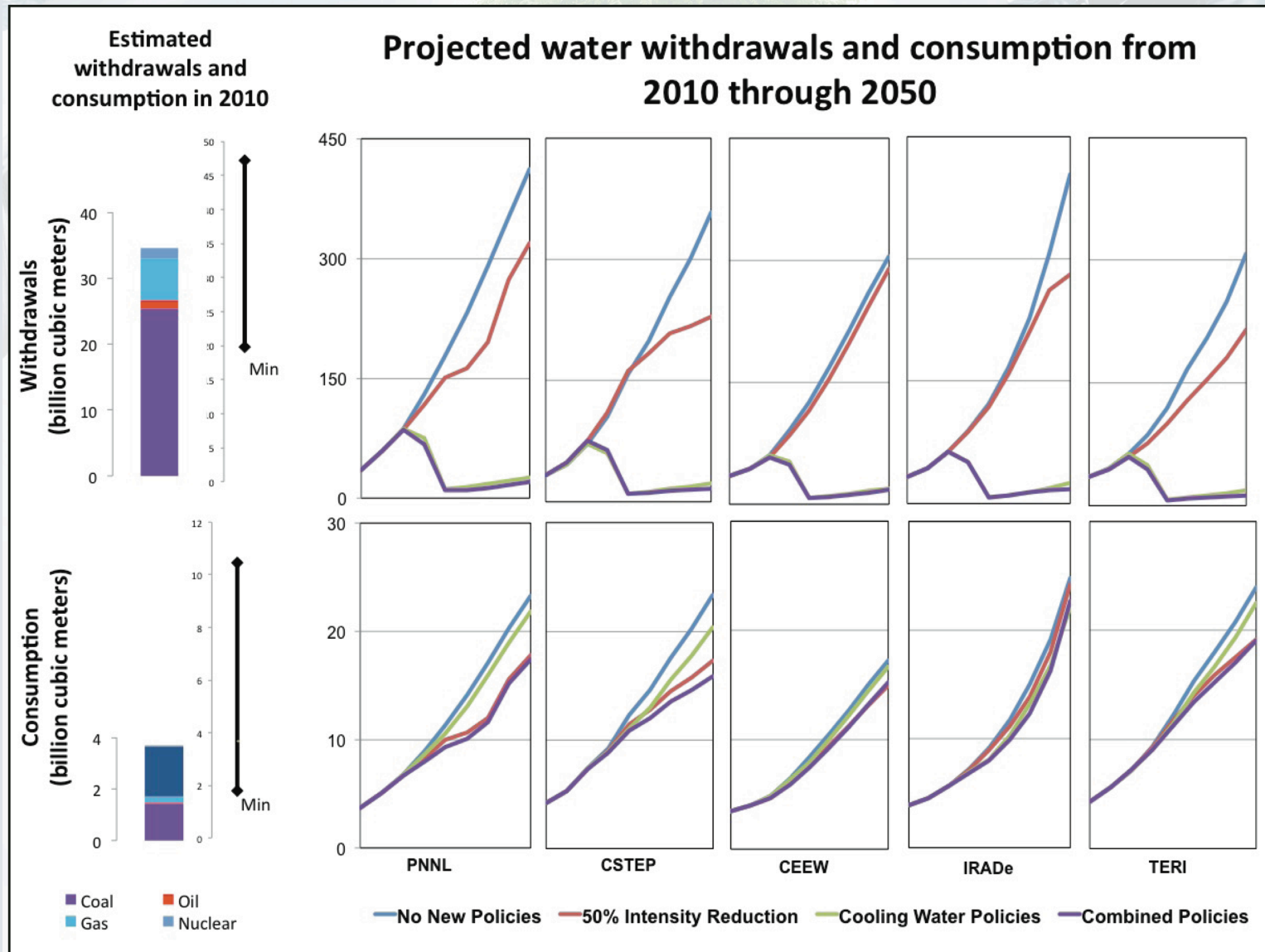
- ❖ Sharing modeling expertise
- ❖ Technical assistance

Future Electricity Production in India



Preliminary Results – Not for Citation or Distribution

Water Withdrawals and Consumption



Next Steps

- Linking water demands across all sectors, considering regional as well as national water scarcity.
- Improvements to current data regarding water use and electric cooling technologies.
- Considering the implications of changing climate for water scarcity.
- Exploring both regional and national dynamics.

Questions