

Transmission Planning for a High Renewable Energy Future: Lessons from the Texas Competitive Renewable Energy Zones Process

6 September 2017

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Agenda

1

Welcome & Introductory Remarks

2

Overview of the Clean Energy Solutions Center

- **Katie Contos**, Clean Energy Solutions Center

3

Presentations

- **Nathan Lee**, Postdoctoral Researcher, NREL
- **Jeff Billo**, Senior Manager of Transmission Planning, ERCOT

4

Question and Answer Session

- **Ilya Chernyakhovskiy**, Research Analyst, NREL

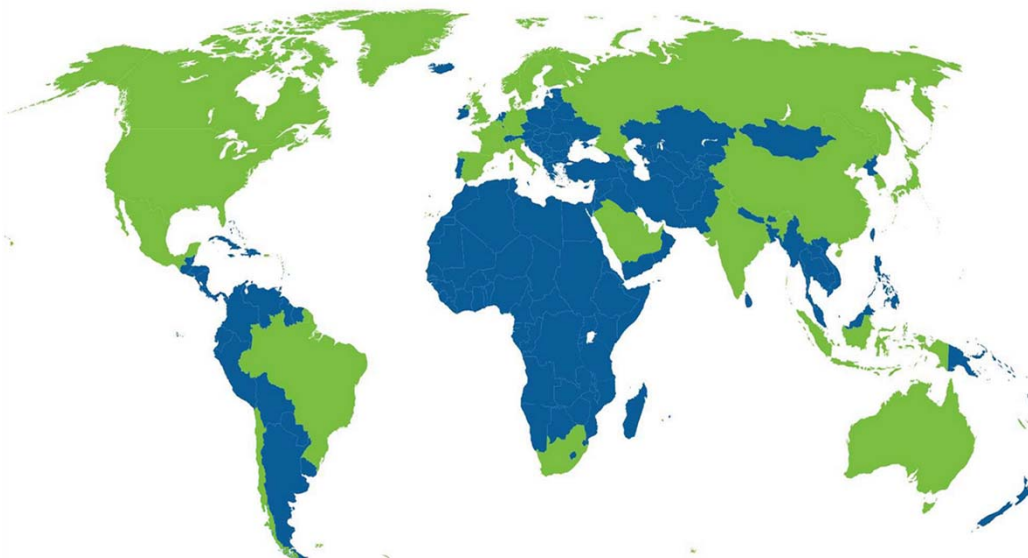
Clean Energy Ministerial

The Solutions Center:

- Launched under the Clean Energy Ministerial (CEM) in 2011

Clean Energy Ministerial:

- A high-level global forum to promote policies and programs that advance clean energy technology, to share lessons learned and best practices, and to encourage the transition to a global clean energy economy.



90%
of
Clean energy
investment

&

75%
of
Global CO₂
emissions

Solutions Center: Background & Vision

- Multilateral initiative, of the Clean Energy Ministerial, has been co-led by the Australian Department of the Environment and Energy, and the U.S. Department of Energy. Additional funding support from Sweden's Ministry of the Environment and Energy, and Power Africa
- In-kind support from Canada and Mexico
- The Solutions Center is a unique CEM initiative assisting countries in all regions of the world in strengthening clean energy policies and finance measures
- Supporting transition of clean energy markets and technologies



*US participation & leadership are under review.

Solutions Center: Goals and Audience

Programs and Services

- **Team of 50+ experts from around the globe responded to 350+ requests for policy support from more than 80 countries**
 - Extensive support across Africa, Asia, and LAC
 - Launched support for finance measures in 2015
- **Trained over 15,000 officials through more than 225 webinars and training events with others**
- **Strong & growing partnerships with development agencies and regional and global organizations in delivery of support**
- **Over 5500 resources in curated library for policy makers**

Target Audiences

- **Primary**
 - Government Policy Makers and Advisors
- **Secondary**
 - Private-Sector Companies
 - Energy Entrepreneurs and Investors
 - Non-Governmental Organizations
 - Civil Society
 - Others Engaged in Clean Energy

Solutions Center: Partnerships

More than 35 international partners:

- Climate Technology Center and Network (CTCN)
- ECOWAS Center for Renewable Energy and Energy Efficiency (ECREEE)
- Inter-American Development Bank (IDB)
- International Energy Agency (IEA)
- International Partnership for Energy Efficiency Cooperation (IPEEC)
- International Renewable Energy Agency (IRENA)
- Low Emission Development Strategies Global Partnership (LEDS-GP)
- Renewable Energy Policy Network for the 21st Century (REN21)
- Sustainable Energy for All (SEforALL)
- United Nations Environment Programme (UN Environment)
- USAID Power Africa (USAID PA)

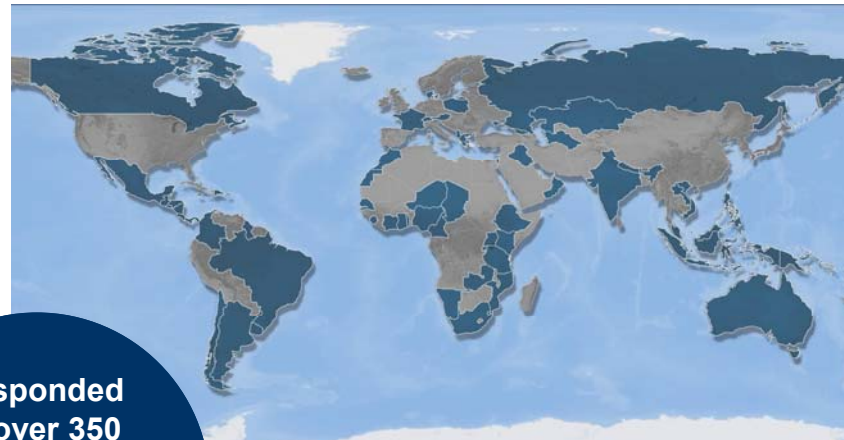


Ask an Expert: Our Experts in Action



We connect you to a global network of energy experts for personalized attention and quick response technical assistance on **strategies, regulations, standards, financial incentives, and energy transition programs** for a broad range of clean energy sectors and technologies including:

- Carbon Capture Utilization & Storage
- Energy Access
- Energy Efficiency
- Renewable Energy
- Smart Grid
- Transportation
- Utilities



Responded to over 350 requests for assistance from over 80 countries.

To request assistance, register on <http://cleanenergysolutions.org/expert>

Nathan Lee, Postdoctoral Researcher, NREL



Nathan Lee, Ph.D., is a Postdoctoral Researcher with the Integrated Decision Support group at NREL. Nathan's research and work concentration is in energy system and power system planning with a focus on generation and transmission systems. He is interested in applying research internationally to support energy strategy formation in developing economies. Nathan's doctoral research focused on developing a multi-criteria decision assessment methodology for national energy planning activities in developing countries, focusing on energy access, costs, and greenhouse gas emissions. The Economic Community of West African States, with an emphasis on Ghana, was used as a representative area of study for this work. Nathan received his Ph.D. and Diploma of Advanced Studies (M.S. equivalent) in Sustainable Energy Systems, Faculty of Engineering of the University of Porto, Portugal.

Jeff Billo, Senior Manager, ERCOT



Mr. Jeff Billo is the Senior Manager of Transmission Planning at ERCOT. In this role he oversees the near-term and long-term transmission planning efforts at ERCOT, including both steady-state and stability analyses. He actively participates on the ERCOT Reliability and Operations Subcommittee, Regional Planning Group, Planning Working Group, and Planning Geomagnetic Disturbance Task Force. Jeff has been at ERCOT for thirteen years during which time he has supervised over 300 generation interconnection projects and was one of the principal planners for the CREZ project. He was also a member of the North American Electric Reliability Corporation (NERC) Protection and Control (PRC-025) Generator Relay Loadability Standard Drafting Team and currently serves on the NERC Planning Committee. He has coauthored several IEEE papers on the topics of transmission planning and wind generation. Jeff holds an MS in Electrical Engineering from The University of Texas at Austin in Austin, Texas and a BS in Mechanical Engineering from LeTourneau University in Longview, Texas.

Ilya Chernyakhovskiy, Research Analyst, NREL



Ilya Chernyakhovskiy is a co-author of USAID and NREL's [GreeningtheGrid.org](https://www.greeningthegrid.org) toolkit. He serves as the lead for NREL's Scaling Up RE in Central Asia project under USAID's Power the Future initiative. Ilya also supports various capacity building and technical assistance activities in the Asia region under the Low Emission Development Strategies Global Partnership (LEDS GP). Prior to joining NREL, Ilya was involved in economic development research at the Higher School of Economics in Moscow, Russia. Ilya earned his M.Sc. in Natural Resource Economics from the University of Massachusetts Amherst.

Question and Answer Session



**Nathan Lee, Postdoctoral
Researcher, NREL**



**Jeff Billo, Senior Manager,
ERCOT**



**Ilya Chernyakhovskiy,
Research Analyst, NREL**

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