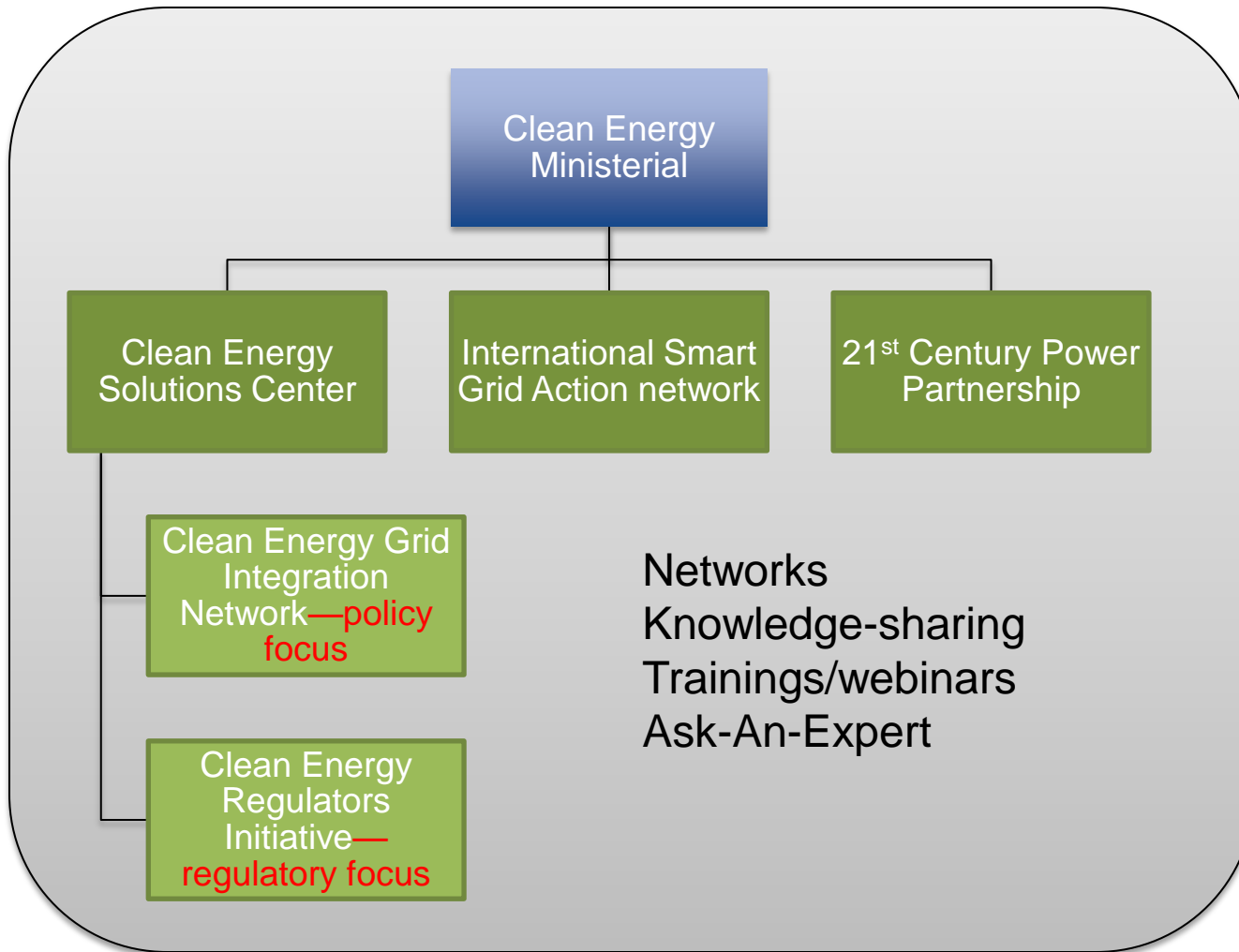


# Technical Assistance Resources to Support Grid Integration Initiatives

Jessica Katz  
National Renewable Energy Laboratory  
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# Overview



A light blue rounded rectangle containing a red box at the top with the text "Greening the Grid". Below the red box, the following text is listed: "Resources", "Trainings/webinars", "Ask-An-Expert", and "In-depth technical assistance".

# Clean Energy Solutions Center (CESC)

CleanEnergySolutions.org

The Clean Energy Ministerial (CEM) launched the Clean Energy Solutions Center in April 2011.

## The Solutions Center:

- Is one of several CEM Initiatives, which include:
  - Global Superior Energy Performance Partnership
  - Super-Efficient Equipment and Appliance Deployment initiative
  - Global Lighting and Energy Access Partnership
- Helps governments design and adopt policies and programs that support the deployment of clean energy technologies
- Has more than 35 partners, including IRENA, IEA, IPEEC, Sustainable Energy for All, Bloomberg New Energy Finance and Leonardo Energy
- Is co-chaired by the U.S. Department of Energy and the Australian Department of Industry.



# CESC: Goals and Audience

CleanEnergySolutions.org

## Goals

- **Serve** as a principal clearinghouse of clean energy policy and program resources.
- **Share** clean energy policy best practices, data, and analysis tools across countries
- **Deliver** dynamic, customized services that will enable expert assistance, learning, and peer-to-peer sharing of experiences .
- **Foster** dialogue on emerging policy issues and innovation across the globe.
- **Serve** as a primary resource for project financing options and information to expand markets for clean energy

## 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

# CESC Ask-an-Expert: No-Cost Assistance

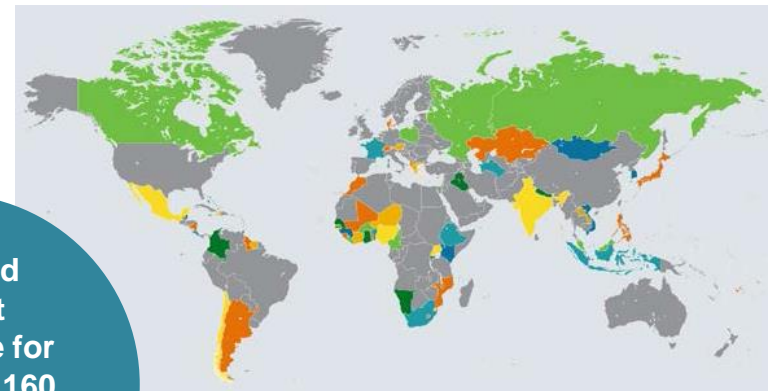
## Ask an Expert: Developing Solutions to Policy Barriers



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 deployment programs** for a broad range of clean energy sectors and technologies including:

- Energy Access
- Energy Efficiency
- Renewable Energy
- Smart Grid
- Transportation
- Utilities

Delivered  
no-cost  
assistance for  
more than 160  
requests from  
over 75  
countries.



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

# Clean Energy Grid Integration Network (CEGIN)

- Objective: Help strengthen **policies and programs** to enable high levels of renewable energy generation for electricity systems, along with related demand response, smart grid, and storage solutions.
- Partners:
  - Clean Energy Solutions Center
  - 21st Century Power Partnership
  - US Agency for International Development (USAID)
  - Asia Low Emission Development Strategies Partnership (ALP)
  - Greening the Grid

# CEGIN Resources & Services

- **Expert Technical Assistance**
  - Customized expert technical assistance from the Clean Energy Solutions Center and other technical institutions.
- **Training and Knowledge Exchange**
  - Web-based seminars, training workshops and other peer-to-peer learning forums to facilitate the sharing of good practices and capacity building and enable direct exchange of experiences across countries.
- **Technical Resources on Good Practices**
  - Provides a curated library of the most relevant reports, data and tools to help accelerate clean energy grid integration policy design.
- **Regional and Global Networks**
  - CEGIN is establishing a network of Asian country officials (regulators, system operators, and energy planners) who are developing clean energy grid integration policies and programs to share good practices and solutions for grid integration.
  - CEGIN is exploring opportunities to create similar networks in other regions.

# Clean Energy Regulators Initiative (CERI): Effective Regulation

<https://cleanenergysolutions.org/CERI>

**Clean Energy  
Regulators  
Initiative  
(CERI)**

## **Right Mix of Regulations**

- Feed-in tariffs
- Renewable portfolio standards
- Grid integration



<https://cleanenergysolutions.org/CERI>

- Collaboration: Leonardo Energy, Clean Energy Solutions Center, and 21<sup>st</sup> Century Power Partnership
  - Lord Mogg and David Haldearn: members of Clean Energy Solutions Center Advisory Board
- Serves as a knowledge provider on clean energy topics
  - Current developments
  - Regulations and best practices
  - Capacity building for utility regulators on EE, demand-side management, smart grids, and RE deployment/integration
- Consults with existing networks & knowledge providers, e.g. ACER, CEER, NARUC, ERRRA, ICER, AFUR, IIT, FSR

<https://cleanenergysolutions.org/CERI>

- No-cost support provided by clean energy regulation and policy experts
  - Riley Allen, the Regulatory Assistance Project (RAP)
  - Xavier Lemaire, Sustainable Energy Regulators Network (SERN)
  - Toby Couture, E3 Analytics
- Examples of assistance
  - Review feed-in-Tariff policy
  - Capacity building frameworks for regulators
  - Solar generation license application review
  - Grid integration and transmission
- The CERI [webinar programme](#) delivers a series of sessions around major challenges in energy markets
- Developing a curated library of clean energy resources important to regulators

# What is ISGAN?

## In Summary...



- International Smart Grid Action Network =

**Strategic platform to support high-level attention and action for the accelerated development and deployment of smarter, cleaner electricity grids around the world.**

- Activities build a global understanding of smart grids, address gaps in knowledge and tools, improve peer-to-peer exchange, recognize excellence
- Includes representatives of governments, national laboratories and research institutions, transmission and distribution system operators, power generators, and others from 24 countries and E.C.
- An initiative of the Clean Energy Ministerial
- Organized as the Implementing Agreement for a Co-Operative Programme on Smart Grids (ISGAN)

Visit [iea-iscgan.org](http://iea-iscgan.org)

# What is ISGAN?

## Strengths...



- **Broad Expert Network:** ISGAN leverages expertise from governments, national laboratories and research institutions, transmission and distribution system operators, power generators, and others from 25 countries from five continents.
- **Partnerships with Thought Leaders:** ISGAN engages leading private sector smart grid initiatives, the IEA Energy Technology Network, and other Clean Energy Ministerial initiatives to advance systems perspectives on power grids and grid integration.
- **Diverse Portfolio:** ISGAN implements a range of activities to support a better global understanding of smart grids and the value they offer, address gaps in knowledge and tools, enhance peer-to-peer exchange, and otherwise improve international coordination.

Visit [iea-iscgan.org](http://iea-iscgan.org)

# ISGAN Ask an Expert



*The International Smart Grid Action Network and the Clean Energy Solutions Center are launching a new joint service to provide no cost remote, Ask an Expert assistance to countries around the world with design of smart grid programs. This service will be added to the existing clean energy policy assistance offered by the Clean Energy Solutions Center and will be available to government agencies and technical institutes supporting governments from any country.*

Visit [iea-isgan.org](http://iea-isgan.org)



# 21<sup>ST</sup> CENTURY POWER PARTNERSHIP

## A MULTILATERAL CEM EFFORT

### Country-level Programs

Teams with key stakeholders in **India**, **Mexico**, and **South Africa** to support power system transformation activities such as modeling, road-mapping and integration.

### Knowledge Development and Sharing

Coordinates knowledge development and dissemination, including reviewing, researching and developing case studies of policy-relevant power sector issues.

### Organizing Global Networks of Expertise

Organizes platforms for multilateral expert consultations, workshops and fellowships.

Power Partnership  
Steering Group (PPSG)

India	Mexico
United States	South Africa
Denmark	Spain
Finland	+CIFF

Public-Private  
Leadership Forum (PPLF)

Private sector representatives:  
Infrastructure, Power Delivery,  
Investors, Tech Companies, NGOs

21CPP  
Operating Agent

 **NREL**  
NATIONAL RENEWABLE ENERGY LABORATORY

# 21<sup>ST</sup> CENTURY POWER PARTNERSHIP: WHAT IS IT?

## Multilateral CEM effort across three main bodies:

### Power Partnership Steering Group (PPSG)

Develops and guides 21CPP  
program of work.

Governments of:

India  
United States  
Denmark  
Finland  
Mexico  
South Africa  
Spain  
and the Children's Investment  
Fund Foundation

### Public-Private Leadership Forum (PPLF)

Coordinates activities with private  
sector stakeholders.

Executes knowledge-exchange  
activities across countries.

Provides input for the annual  
program of work.

Private sector representatives:

Power Infrastructure Development  
Power Delivery  
Investment Community  
Technology Innovators  
Multilateral Organizations

### 21CPP Operating Agent

Assists the PPSG and PPLF  
in developing and executing  
the program of work,  
stakeholder coordination, and  
administrative activities.

Current Operating Agent:



# The Greening the Grid Toolkit

- HOME
- OVERVIEW
- TRAININGS
- INTEGRATION TOPICS
- ASK AN EXPERT
- GLOSSARY
- RESOURCES



## Understand Grid Integration Basics

Review concise fact sheets covering a variety of key issues. [Read more](#)

## Greening the Grid

### What is Grid Integration?



*The Challenge:*  
*Large-Scale, Grid  
Connected Clean  
Energy*

Power grids are complex networks that balance electricity supply and demand around the clock, every day of the year. Renewable energy, such as solar and wind, can significantly reduce greenhouse gas emissions from electricity generation.

[Read more](#)

### What We Do



*Technical  
Assistance and  
Collaboration*

Greening the Grid offers a toolkit of information, guidance materials, and technical assistance to support countries in significantly scaling up the amount of variable renewable energy connected to the electricity grid.

[Read more](#)

### Ask an Expert



*Request information  
and assistance*

Greening the Grid connects power system stakeholders to experts from our grid integration expert network to provide no-cost, remote consultation and advice.

[Submit a Request](#)



# What We Do



Offer a **toolkit** of information and guidance materials to inform the development and implementation of grid integration roadmaps



Facilitate direct **technical assistance** tailored to the unique power system characteristics and priorities of each partner country

*Greening the Grid is a component of the U.S. Government's Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) program*

# Greening the Grid: Examples of Offerings

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## Toolkit

- **2-page briefs** on key grid integration topics (e.g., flexibility, demand response and storage)
- **Curated library** of resources organized by integration topic (e.g., ancillary services, balancing area coordination)
- **Webinars** on grid integration topics

## Technical Assistance

- Ask-an-Expert: for on-demand, remote technical assistance
- In-depth assistance available through USAID
  - E.g., Philippines grid integration study, Jamaica net metering program evaluation
- In-person trainings
  - E.g., wind and solar forecasting workshops in Feb. 2016

# Contacts and Additional Information

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## Clean Energy Solutions Center

[cleanenergysolutions.org](http://cleanenergysolutions.org)

Contact Us: <https://cleanenergysolutions.org/contact>

## Greening the Grid

[greeningthegrid.org](http://greeningthegrid.org)

Email: [greeningthegrid@nrel.gov](mailto:greeningthegrid@nrel.gov)