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National Association of Regulatory Utility Commissioners

USAID Office of Infrastructure and Engineering Bureau for Economic Growth, Agriculture, and Trade

Infrastructure Workshop

The Role of the Regulator in Deploying Renewable Energy

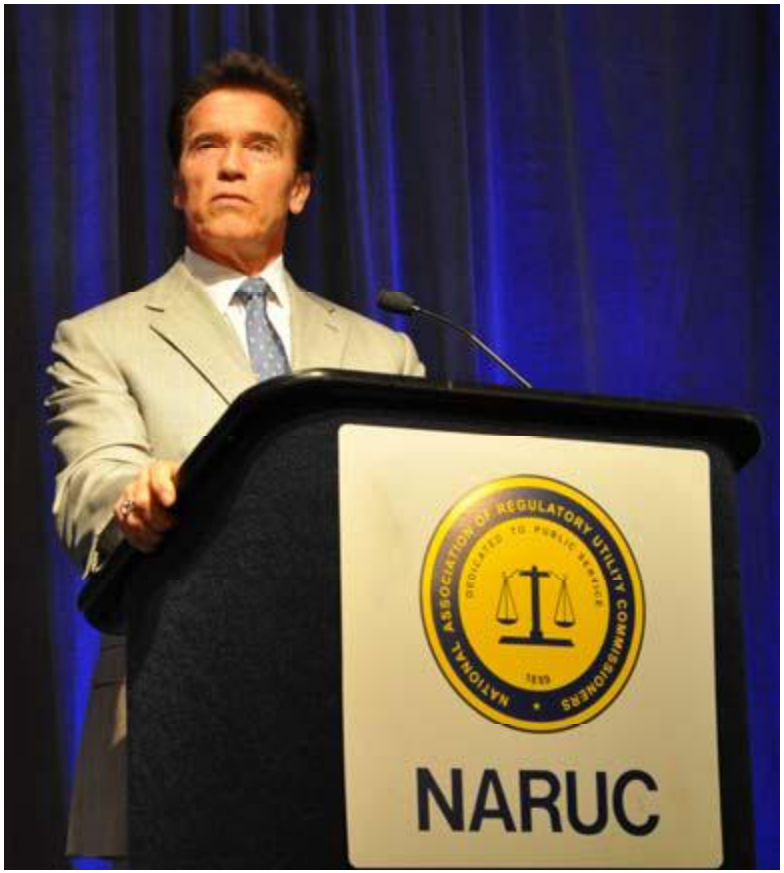
December 2010

Who is NARUC?

- The National Association of Regulatory Utility Commissioners (NARUC) is a quasi-governmental non-profit organization founded in 1889
- Our Members include the state Commissions (government agencies) engaged in the regulation of American utilities in the 50+ states & territories that regulate electricity, natural gas, telecommunications, and water utilities
- NARUC has Associate Members in over 20 other countries

What does NARUC do?

- Forums and activities for the exchange of experience/policy
- Education (Conferences, Trainings, Technical Workshops)
- Advisory Services & Outreach to Congress, Federal Agencies, Other Stakeholder Groups
- Research & Information Exchange (Publications, Grant Projects)
- International Programs



Enhancing Sustainable Utility Regulation (ENSURE)

- Bilateral Regulatory Partnerships
- Training and capacity building for national regulatory agencies and regional regulatory associations
- Technical workshops
- Information dissemination

US Policy Priorities – (Excerpt from Secretary Clinton's Confirmation Hearings):

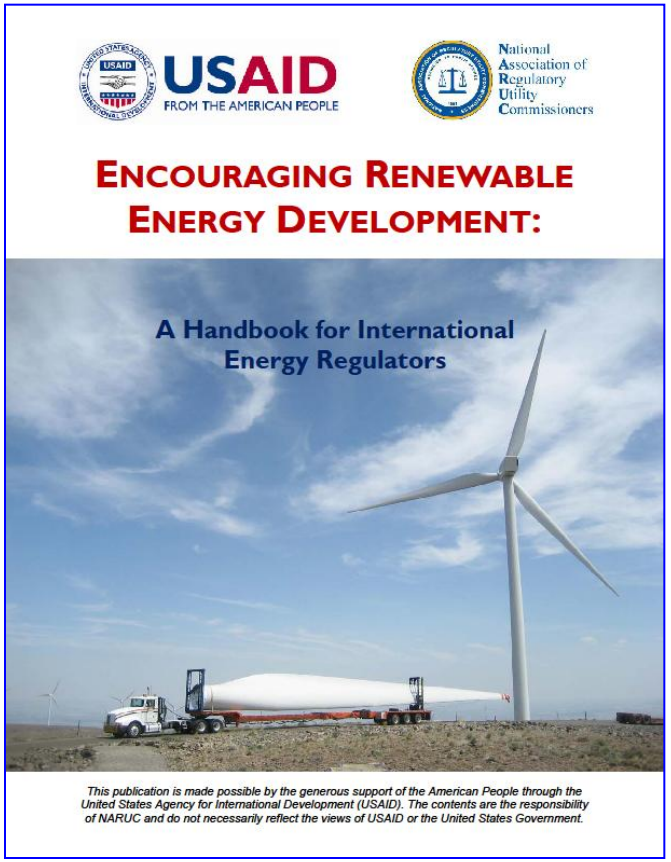
"As developing countries address energy poverty, the United States should do all it can to promote the adoption of clean energy technology and best practices…. U.S. foreign assistance that promotes energy access in the developing world should focus on clean energy technology – which includes renewable energy, energy efficiency, as well as clean coal technology."

Source: http://lugar.senate.gov/energy/press/pdf/ClintonQFR.pdf

NARUC's Clean Energy Series

- Goals:
  - To explore issues common to regulators around the world are facing in implementing national policies regarding RE
  - To facilitate international and regional sharing of experience and lessons learned

  through:
    - Workshops and trainings
    - Internships
    - Publications
    - Other forums



www.naruc.org

Why Renewable Energy?

- Sustainable economic growth
- Security of supply
- Environmental benefits
- Price stability for developers, residential customers, businesses
- Increased opportunities for financing as compared to other power sources
- and multiple other policy reasons

What Qualifies as a Renewable Energy Source?

- Multiple definitions, but renewable energy sources as defined by various countries and states include:
  - Wind
  - Photovoltaic cells/panels
  - Solar thermal
  - Geothermal
  - Hydropower
  - Biomass
  - Nuclear? (controversial but usually not)
  - Clean and untreated wood
  - Methane from landfills or from wastewater treatment
  - Other biogases
  - Fuel cells
  - Wave and tidal
  - Dedicated Crops
  - Cellulosic and other agricultural residues

Policy Challenges for Renewable Energy

- Pricing/affordability

  vs.

  Return to investors

- Legal/Regulatory Framework
- Public awareness
- Coordination between multiple governmental and regulatory bodies, environmental agencies, customers, utilities, developers and investors
- Benefitting rural and vulnerable populations

Transmission Challenges

- Connection to the Grid
  - Transmission interconnection – new investment in transmission frequently required to support new RE
  - Renewables are most plentiful away from urban load centers
  - Distributed generation may be an option for RE
- Regulator has unique role in drafting/adopting connection (transmission and distribution) rules, approving investment planning

Challenges with predictability

- Based on natural cycles of weather and seasons
  - Solar/wind: seasonal variation, short term fluctuations due to weather…
  - Hydropower: seasonal, droughts, snowmelt cycles…
  - Biomass: seasonal harvest cycles of fuel source plants…
  - Fundamentally different than conventional fuels (gas, coal, diesel) that have constancy, predictability

Operating Challenges

- Operating and system challenges:
  - Supply and demand must be constantly and precisely balanced to meet demand in real time
    - Current operating systems tend to keep control over timing and quantity of fuel sources; frequency regulation
  - RE that is variable cannot be controlled or stored with the same reliability as fossil fuels
  - Potential risk to system security
  - Need to improve forecasting, adjust approach
- Lack of Qualified staff

Operating Challenges- integration of variable energy resources (VERS)

Examples:

- *Denmark*
  - 2005 hurricane lasting 6 hours → resulted in loss of 83% total wind generation
  - Growth in variable energy resources magnifies the impact of small weather forecasting errors
- *Hungary*
  - Total capacity approx. 200 MW grid connected, prior to 2007 support schemes heavily supported new investment in RE
  - 2007 Electricity Act revised support scheme to include evaluation of the effect that new RE source will have on system integrity

Why is the Regulator Important?

"The Overriding Criterion: A legal and regulatory framework that is fair, consistent, predictable where contracts and agreements are reasonably enforceable."

World Bank Energy and Mining Sector Board Discussion Paper 6, May 2003

How Does Regulation Affect Investment?

- Consistent regulatory process maintains stability of laws, regulations and contracts → predictability and credibility
- Competition for capital and investment is global, and capital is mobile → investment can be invited, not compelled
- Regulator or Ministry must meet reasonable investor-backed expectations and time frames

Foundational Regulatory Principles

- Independent, transparent, competent Regulator
- Politically stable, corruption-free regulatory environment
- Must achieve efficiency and transparency
- Opportunity to earn a fair profit
- Enforceable contracts
- Consistent application of renewable energy tariff methodology and related secondary legislation

What is the authority of the regulator?

No formal authority

- ***No formal authority****, though expertise and knowledge of the sector mean that the regulator can prove invaluable as an advisor and facilitator*

Limited formal authority

- ***Limited formal authority****, with partial ability to implement government policies and some areas of responsibility, e.g., issuing licenses or implementing tariff levels*

Strong formal authority

- ***Strong formal authority*** *to implement government policies in support of renewable energy, including passing tariff methodologies and determining the duration of any mandatory purchase agreements*

Key Policy Principles

- Price
- Coordination
- Select of and commit to one coherent support scheme
- Framework w/ built-in flexibility
- Return on investment
- Rural and vulnerable populations

Guiding regulatory principles

- ***Transparency***
- ***Clarity***
- ***Predictability***

Support Schemes

- Feed-in Tariffs (FIT)
  - Standard offer contracts
  - REFITs
  - Renewable tariff
- Quota/Obligation Systems
  - Renewable portfolios standards
  - Green credits/certificates
- Fiscal incentives
  - Tax credits
- Carbon policy

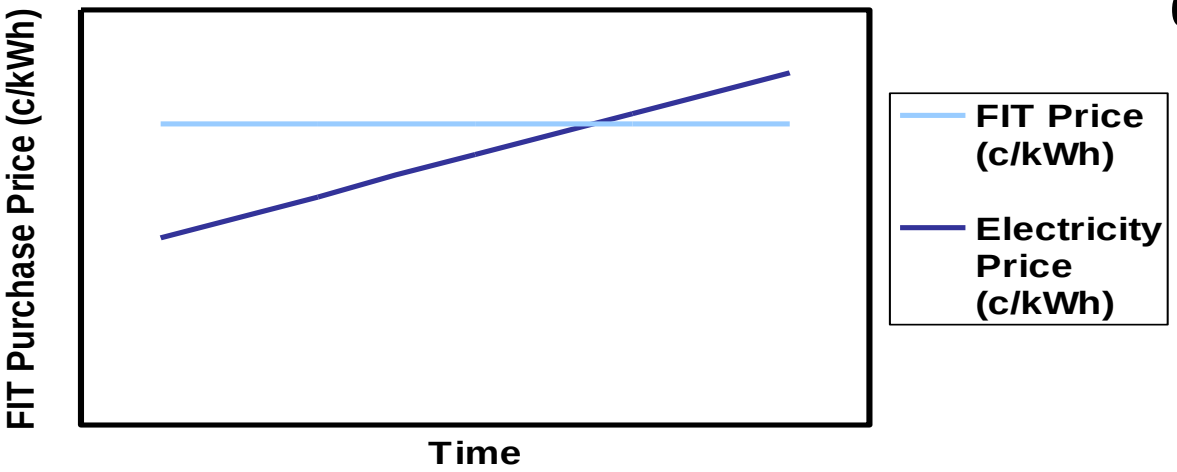
Feed-in tariff (policy issues)

Typically include

- Guaranteed grid access
- Long-term contracts
- Priced to encourage development of RE

Policy Goals Drive Design

- Resource diversity
- Energy Security
- Peak reduction
- Economic development



Feed-in tariffs (considerations)

Benefits

- Likely to produce significant new generation
- Job creation
- Price certainty
  - For developers and ratepayers
- Increased opportunity for financing
- Flexibility in design

Challenges

- Likely to increase electric rates in the short-term
- Doesn't address up-front capital costs
- Difficulty in setting prices
- Administrative commitment
  - Establishing program
  - Periodic review

Renewable Energy Country Case Studies

- Stories of regulatory experience – success, challenges and lessons learned can be found in NARUC's RE Handbook
  - Philippines
  - Egypt
  - Jordan
  - Guatemala
  - Namibia
  - Armenia
  - Ghana
  - El Salvador
  - many more illustrative examples…

Armenia Case Study- RE Framework

- Armenian Public Services Regulatory Commission (PSRC) established in 1997 (1996 Energy Law)
- hydropower = 30% of overall generation, 100% of RE
- Amendment to Energy Law (2001)
  - dispatching priority to all electricity produced from small hydropower plants and other RE for 15 years
- 2004 Law “On Energy Saving and Renewable Energy”
  - applicants must submit to PSRC a business plan w/environmental impact assessment and plan to meet environmental impact limits
- FIT that drives hydropower investment, particularly for small plants

Armenia Case Study- reality and challenges

- Despite efforts of the regulator, long-term contracts and tariff security remain a challenge
  - new application be made 30 days prior to the expiration of license
  - difficulties in securing funding
- PSRC is autonomous and operates in a transparent manner
  - investment projects have encountered stumbling blocks that have delayed realization of full funding
- *"…obstacles are primarily to do with the rigidity of the regulatory framework, which properly exists to guard against corruption and manipulation, but does not offer long term security for investors."*

Jordan Case Study- adaptation

- Jordan imports 97-98% of its energy resources
- Strong RE potential but currently only 1-2% of electricity generated from RE
  - National Energy Strategy: 7% RE by 2015 & 10% by 2020
- 2007 Energy Strategy listed obstacles to renewable energy development as including:
  - high capital costs of RE
  - need for large amounts of land which can be hard to secure
  - lack of legislation, including treatment of customs and tax issues

→ 2010 Renewable Energy & Energy Efficiency Law

Jordan Case Study Example- reality and challenges

- Negotiations for the first commercial-scale wind farm started in 2009 and stalled the same year → *need to adapt legal and regulatory framework to meet policy goals*
- Currently reviewing the regulatory issues related to RE
  - Reference Price
  - incorporating RE needed regulations in the regulatory documents
  - reviewing the technical details for connection to the grid
- Cost of RE remains a big hurdle
  - 2010 Fuel adjustment clause to account for price fluctuation
  - 2010 Renewable Energy and Energy Efficiency Fund for private sector companies/ investors Jordan, to support energy-saving and renewable energy initiatives

Namibia Case Study- policy goals

- 1998 White Paper "Programme on the Promotion of the Use of Renewable Energy Sources"
  - *Policy goal: "maximum social and economic benefit, taking into account long-term environmental concerns while giving priority attention to the country's development needs"*
- Namibia Renewable Energy Programme was designed to increase affordability and access to RE services and accelerate market development for renewable energy technologies by reducing existing barriers, including human capacity, financial, technical, awareness and other market limitations.
- The regulator is currently engaged in a consultation process to determine the RE incentive structures best suited to Namibia.

Namibia Case Study- reality and challenges

- Namibia has abundant RE resources, in particular wind, solar and biomass → pricing remains a challenge
  - ongoing work in required to lessen fragmentation of the regulatory framework and modernize it to encourage investment in RE
- Electricity tariffs not cost-reflective
  - Higher RE costs raise challenges for bringing technology to market
- Scalability
  - financing has stemmed from grants or consumers that generate electricity for their own localized consumption

Concluding Remarks/Take-aways

- RE policies must have a clearly defined policy goal(s)
- A predictable and transparent regulator is necessary to promote RE investment
- Energy law and regulations may need to be reviewed and supplemented to enable RE.

"By reason of expertise and access, regulators are the natural leaders of today and the future of national efforts to encourage RE"

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Thank You

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