Integrated Resource & Resilience Planning (IRRP) for the Power Sector

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Session 5: Options for Results/Outputs

Presenters: Juanita Haydel, Maria Scheller, Sanjay Chandra
What are the IRRP Results and Outputs?

Presenters: Juanita Haydel
Outputs of the IRRP Process

Direct Outputs of the Modeling

- Average and marginal energy ($/MWh) and capacity ($/MW-year) power prices
- Fuel prices* ($/MMBtu) and total expenditures ($)
- Emissions allowance prices ($/ton)
- Emissions (tons)
- Dispatch decisions (GWh)
- Capacity additions decision by resource type
- Plant life extension decisions**
- Plant retirement decisions
- Transmission line builds**

Supplemental Analysis

- Compliance Decisions
- Compliance Costs relative to the reference or Business as Usual case
- Discounted cash flow analysis/valuation
- Revenue requirements

*when fuel resources and markets are modeled endogenously

** if modeled
Analysis Supported by IRRP

- Long-term purchase strategy
- RFP bid review and ranking
- Retirement of resources
- Build versus buy decisions
- DSM planning decision
- Integration of resources to system
- Policy implications including renewable portfolio standards and environmental policies
- Maintaining system resource adequacy
- Value at Risk
- Asset screening assessments
- Identify development opportunities
- Valuation of assets and portfolios
- Due diligence assessments
- Buy and sell side support
How can IRRP Results be used?

Presenter: Maria Scheller
IRRPs Inform Decisions

**IPPs**
- Do attractive development opportunities exist?

**Regulators**
- Are utilities making prudent decisions? Are rate impact justified?

**PPPs, Developers**
- Do structural developments support investment?

**Utilities**
- Can investment alternatives be prioritized to meet customer demand?
- Do regulatory policies support growth opportunities?
- What are the risks for stranded assets?
- Perform cost/benefit of procurement options.

**Financial Investors**
- Are plans sound in the face of risks?

**Government Agencies**
- What can be done to encourage market participation?
- Are environmental policies in order?

**Grid Operators**
- How will IRP plans affect the grid? Where are infrastructure developments needed?

**Stakeholders**
- Are revenue requirements adequately accounted for in rates?
Roadblocks to Identifying or Achieving a Plan

- **IRRP Complexity**
  - The solution is only as good as the data inputs utilized – data collection and analysis drives confidence in results
  - The solution is only as good as the understanding of the people using it – so getting staff comfortable with the tools and processes is a critical step in benefit recognition

- **Resource Development**
  - Long-lived infrastructure projects require ongoing maintenance and support, human resource capability and staffing structure for operations are critical

- **Stability**
  - Investors seek confidence in the regulatory and political structure and alignment of IRRP goals with national policies, including economic and climate goals

- **Financial Security**
  - Transparency in funding alternatives and corporate financial health is critical to attracting investors
How can IRRP Results be used to Attract Investors?

Presenter: Sanjay Chandra
Investment Objective – Energy Market

**Achieve a climate of sustained, high-quality, impactful investment**

**Energy Market**

- Incorporate all forms of energy
- Promote regional initiatives
- Empower customers
- Enhance investments in infrastructure
- Harmonize market and network rules
- Enforce competition and incentive rules

Independent national energy regulators are central to truly competitive markets
How IRRP Aids Investment

Enhances project definitions

**Policy**
Reduces policy risk by establishing direction, alignment and framework

**Integrated Planning**
Solicits input from multiple government and non-government stakeholders

**Timeline**
Helps define potential timeline for project development and implementation

**Impact Investing**
Identifies projects with social and environmental value

**Portfolio**
Multiple project identification and results enables investors to use portfolio approach

**Scale-friendly**
Enables identification of large-scale projects attractive to investors

Reduces risk-reward ratio

Institutionalizes financing

Improves bankability

- Reduces risk-reward ratio
- Improves bankability
- Institutionalizes financing
- Enhances project definitions
Public-Private Partnerships

- Recast public support around a new, national, economic development initiative
- Proposed early launch (incubator) to give investor confidence
- Public funds as seed and leveraged (first loss position)
- Free standing run as private enterprise and advises the government
- Offering products that match investor appetite to sources: e.g., higher returns for high risk construction phase with pre-arranged refinancing of lower returns for O&M phase

Source: The World Bank

- Better solutions – each participant does what it does best
- Time-to-completion as measure of performance
- Fully appraised and shared/demarcated risks
- Higher standards
- Increased efficiencies
Competitive Procurement

Enhancing the process of identifying and securing resources that “best” meet customer’s electricity requirements

Components of Competitive Energy Procurement
- Appropriate strategic sourcing principles, adapted for energy sourcing
- Organization-wide input and buy-in
- Priorities and a detailed plan by market, based on a detailed spend analysis
- An integral risk management plan
- An energy spend portfolio balanced across a number of dimensions
- Criteria, based on timing and price
- Pre-approval for specific procurement and contract actions
IEA 2015 Energy Investments Data

- Total energy investment: 8%
- Investment in:
  - Fossil fuels: 6%
  - Renewables: 1%
  - Energy efficiency: 2%
- Electricity generation spending:
  - Total $420 B; Renewables $288 B (70%)
  - Gas: 40%
- Renewables generation investment:
  - China: $90 B (over 60% of its total investment)
  - European Union: $55 B (over 85% of total)
  - United States: $40 B (over 90% of total)

- Electricity networks investment:
  - $260 B: 14%
  - 55% New demand
  - 35% Upgrade ageing assets
  - 10% Variable RE integration

Source: UNEP