Electricity procurement for the RE-era
Challenges and way forward

Xavier Garcia Casals
Knowledge, Policy and Finance Centre, IRENA

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IRENA’s KPFC work on the Energy Transition

**IRENA** – International Renewable Energy Agency
Comprehensive work on all energy transition dimensions: Technical, Economic, Finance, Policy, Education, Knowledge, Planning, Resources, Environmental ... 

**KPFC** – Knowledge, Policy and Finance Centre
Focus on the social components of the energy transition

- **2016**
- **2017**
- **2018**
- **2019**
- **2020**
- **2021**

- Measuring the Socio-economic footprint
- Renewable jobs
- Auctions and Policies
- Power Market design

https://www.irena.org/publications
IRENA’s work on power Market Design

Focus on current market designs: initial challenges from VRE

Systemic approach: Organizational Structures
- beyond markets
  - common challenges: regulated and liberalized
  - provide vision and enable leapfrogging
- get structures right for the NEW energy system
- focusing policy narrative to prevent barriers
  - long term procurement as a fundamental pillar
  - misconceptions: RE subsidies, low RE prices...
- important links with policy framework:
  - auctions; subsidies; participation & governance

Unequal advance in the different transition layers

**Energy Transition**

**Technological Transition**
- FF
- RE Era
- RE
- EE
- EF

**Systemic changes**
- non-integrated
- few stakeholders
- centralized
- unidirectional
- integration
- participation
- bidirectional
- distributed
- democratization

**Organizational structures (markets...)**
- FF Era
- RE Era

**wider systemic links and feedbacks**
- Earth and Climate
- Society
- Economy
Liberalized vs Public: An inclusive and pluralist narrative

Organizational structure convergence: Aligned economic and social goals

Improved governance

Public ownership pathway

Liberalized pathway

Evolution: building on strengths and overcoming shortcomings

Different social and economic starting points
Transition challenges common to all system structures

Transition Challenges
- Capital-intensive generation (with low operating costs)
- Distributed Energy Resources
- Flexibility requirements
- System integration
- Greater social involvement

Regulation
Markets
Collaboration

Regulate
Compete
Collaborate
An holistic/systemic approach to misalignments

Within power system:
- wholesale electricity pricing
- CRM for fossil fuels
- ancillary services gaps
- bill’s disconnect with transition
- grid death spiral
- cost, price and value

Beyond power system:
- labour dynamics during transition
- aggregated economic activity growth imperative
- inequality
Wholesale market misalignments

A. LOW RENEWABLE PENETRATION

B. HIGH RENEWABLE PENETRATION

Wholesale price

Demand

Capacity (MW)

Marginal Cost ($/MWh)

Dispatched capacity

Low OPEX/Regulated renewable power

Hydro

Coal

Natural Gas

Oil
Electricity price spikes: symptom of same misalignment

- Marginal pricing of ALL electricity
- Surge in natural gas prices
  - All time highs in wholesale electricity prices (up to 700 €/MWh !!!)

- Misalignment becoming evident
- But still failing to see other side of same coin:
  - Transition barriers due to prices tending to zero & price volatility

Diagram:
- Current price spikes
- Transition barrier
The cost-price-value misalignments

CASE 1
- Cost
- Price
- Value

Fossil-fuel power plant

CASE 2
- Cost
- Price
- Value

Additional regulated payments and direct subsides

CASE 3
- Cost
- Price
- Value

Power system value

Additional social value

Levelised cost of electricity

Externalities

Indirect subsides

Market price

IRENA
International Renewable Energy Agency
Proposal for way forward: The Dual Procurement

To provide a stable framework:
- SUPPORT MECHANISMS (FiT, FiP, PPA)
- Direct PUBLIC INVESTMENT

To match supply and demand:
- WHOLESALE AND RETAIL MARKETS
- Centralized SO’s dispatch

**DUAL PROCUREMENT**

- **LONG TERM PROCUREMENT**
  - procuring Renewable Power
- **SHORT TERM PROCUREMENT**
  - procuring Flexibility

experience
Long- and short-term pillars of the dual-procurement system

- Procure RE generation through long term mechanisms (auctions or direct public investment)
  - fit for high-CAPEX / low-OPEX generation
  - fosters electricity adequacy
  - minimizes finance costs
  - driven by LT planning with a focus on system value

- Procure Flexibility through dedicated short-term mechanisms (similar to wholesale/ancillary services)
  - enables flexibility resources participation (DSM, storage, dispatchable REs, system integration...)
  - fosters flexibility adequacy
  - driven by ST dispatch requirements
Thank you!

XCasals@IRENA.org

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