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TRAINING PROGRAM

MODULE 4 | POLICY INCENTIVES AND REGULATORY FRAMEWORK

AGENDA

Renewable Portfolio Standards (RPS) and Competitive Procurement

Luiz Maurer

Washington - 7/8/2012

Agenda

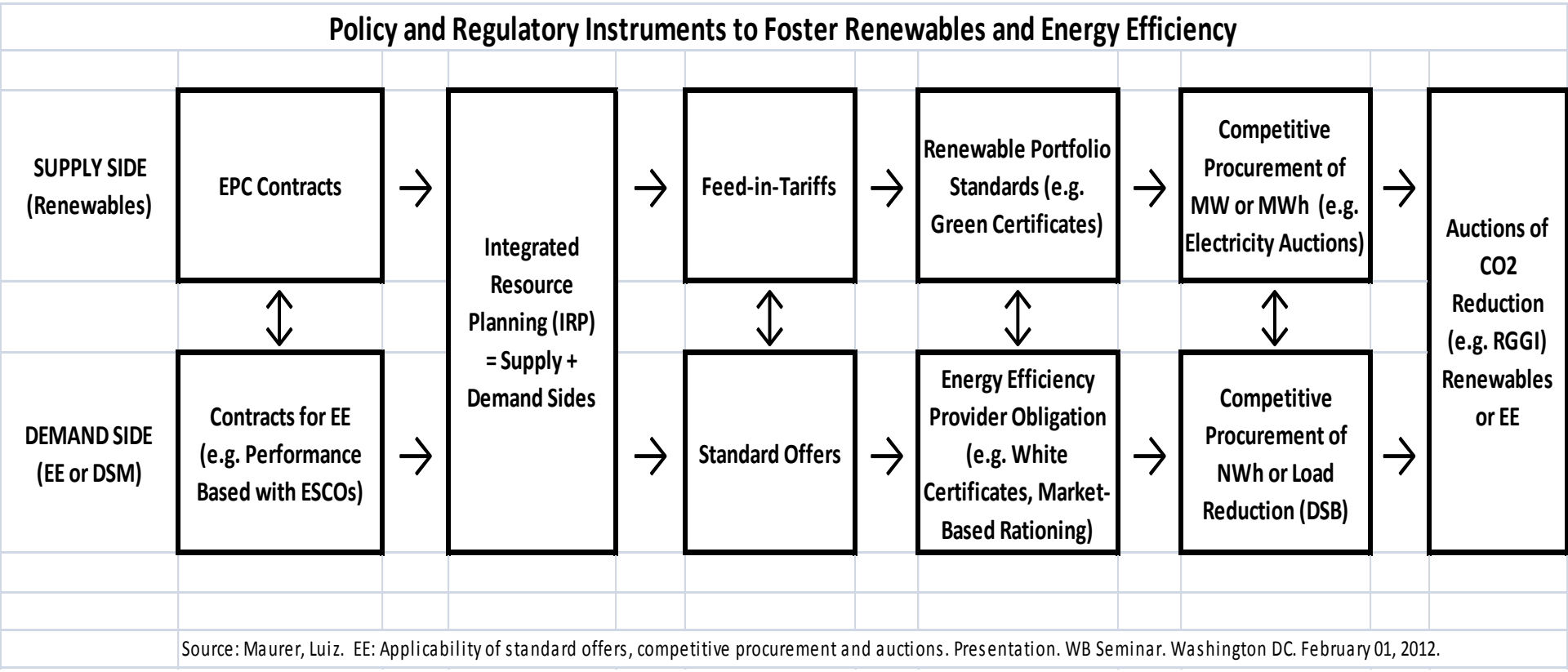
QUOTA MECHANISMS

10:15-11:00am	**Renewable Portfolio Standard (RPS) and Procurement Methods: Reverse Auctions and Competitive Procurement** **Luiz T. A. Maurer** (Principal Industry Specialist, IFC) • Definitions: RPS, green certificates, white certificates, reverse auctions and competitive procurement • Interactions between green and white certificates. • Examples of reverse auctions: Brazil • Examples of competitive procurement in developing countries. Local content issues. • Assessment of effectiveness

The development of Renewables and Energy Efficiency is basically policy and regulatory driven

- Renewables – most of them "out-of-the money"
- Energy Efficiency – huge barriers, some risks, not factored in the McKinsey Curve
- More broadly, in the climate business
  - Supply – issuance of CER s, quotas for EE
  - Demand-

There is a great variety of regulatory mechanisms and business models – ranging from "command and control" to more market-driven, on both demand and supply sides



Source: Maurer, Luiz. EE: Applicability of standard offers, competitive procurement and auctions. Presentation. WB Seminar. Washington DC. February 01, 2012.

Definitions – Why "Quota" Mechanisms?

FIT	Government sets the price (s) and market defines quantities
RPS	Government mandates minimum renewable % in suppliers' portfolio (quantity) Price results from competition for renewables (in some cases MWh unbundled - e.g. Green Certificates)
Competitive Procurement	Government (or Utility) sets quantity and prices are set competitively (e.g. via tender)
Auctions	A special case of competitive procurement where award criterion is solely based on price

Who adopts what?

- Developed countries have tried all of those instruments, on the supply and demand sides– but still a learning process
- FIT (discussed earlier today)
  - 60+ countries
  - Most of our client countries in the developing world (30+)
- RPS = Extensive use in the US and Europe. But just a few in the developing world – India (among others), Chile, The Philippines
- Competitive Procurement (MW or MWh)
  - Most power pools in the US procure MW and ancillary services competitively
  - New Jersey one of the first states to adopt competitive procurement for MWh
  - LAC pioneered with dynamic auctions
  - Mexico has been using competitive bidding for a decade
  - MENA – seems to be preferred choice (except CSP)
  - India (PV), South Africa, China (offshore wind)

The mirror image of FiT for EE – Standard Offers

Standard Offer

Eskom

Energy Efficiency payments at a fixed rate for a fixed period (16 hours)

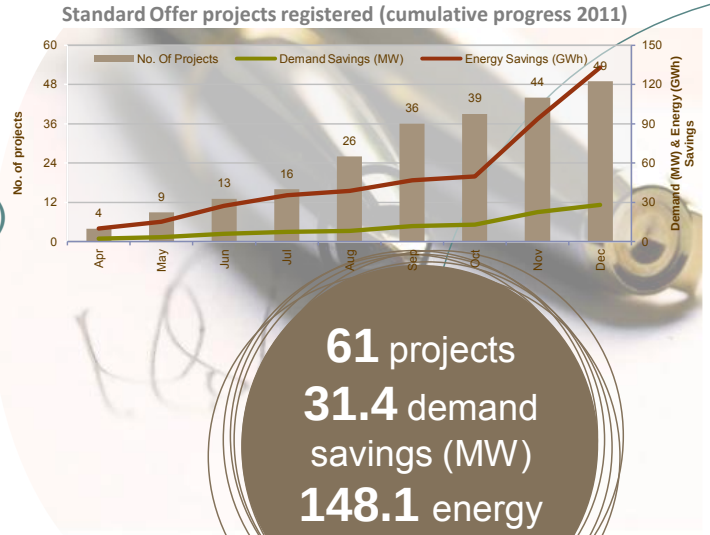
Lighting, LEDs, Hot Water Systems, Solar, Industrial Process Optimisation

Replace inefficient technologies with a pre-approved suite of energy efficient products

Size: 50kW-5MW (Mon-Fri 6:00-22:00)
Market focus: Industrial / Commercial

Standard rate per kWh per technology
42 – 70 c/kWh (Peak Hours)

Sustainability ensured by procuring energy savings over a 3 year period (70% on completion and 10% pa thereafter)



RPS Example – Renewable Portfolio Goals for US States

State	Amount	Year	State	Amount	Year
Arizona	15%	2025	New Hampshire	23.80%	2025
California	33%	2030	New Jersey	22.50%	2021
Colorado	20%	2020	New Mexico	20%	2020
Connecticut	23%	2020	Nevada	20%	2015
District of Columbia	20%	2020	New York	24%	2013
Delaware	20%	2019	North Carolina	12.50%	2021
Hawaii	20%	2020	North Dakota*	10%	2015
Iowa	105 MW		Oregon	25%	2025
Illinois	25%	2025	Pennsylvania	8%	2020
Massachusetts	15%	2020	Rhode Island	16%	2019
Maryland	20%	2022	South Dakota*	10%	2015
Maine	40%	2017	Texas	5,880 MW	2015
Michigan	10%	2015	Utah*	20%	2025
Minnesota	25%	2025	Vermont*	10%	2013
Missouri	15%	2021	Virginia*	12%	2022
Montana	15%	2015	Washington	15%	2020
			Wisconsin	10%	2015

Source: US Department of Energy

“Green Certificates” - The way we measure renewable production - the US Example

One REC represents a volume of qualified renewable energy that is generated and metered. In Texas, this corresponds to one megawatt hour. To meet the RPS targets, utility companies may buy or trade RECs.

Renewable Energy Credits are issued quarterly, based on meter readings. The REC market is administered by ERCOT, the Texas electric grid operator. Penalties for non-compliance with RPS requirements are enforced by the Public Utility Commission of Texas (PUCT), which has the authority to cap the price of RECs and may suspend the standard if necessary to protect the reliability and operation of the grid.

The Mirror Image for EE – Obligations on Utilities (Suppliers to achieve EE) – White Certificates

22 States have Energy Efficiency Resource Standards (EERS)
9 have Efficiency Goals

WA: all cost-effective conservation (~10%) by 2025

OR: 1% annual savings, 2013-14

CA: save 1,500 MW, 7,000 GWh; reduce peak 1,537 MW: 2010-12

NV: 0.6% annual savings (~ 5%) to 2015; EE to 25% of RPS

CO: save 3,984 GWh, 2012 – 20; reduce peak 5% by 2018

AZ: 22% cumulative savings by 2020; peak credits

NM: 10% electric savings by 2020

OK: EE to 25% of renewable goal

TX: reduce 30% annual growth; 0.4% winter and summer peaks beginning 2013

HI: 4,300 GWh electricity reduction (~40% of 2007 sales) by 2030

IA: 1.5% annual, 5.4% cumulative savings by 2020

IL: 2% energy reduction by 2015; 1.1% from 2008 peak by 2018

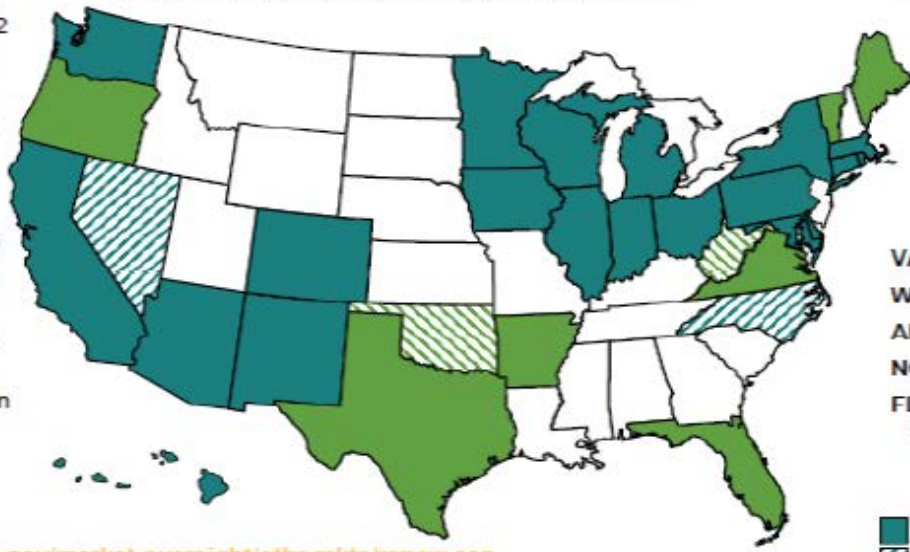
IN: 2% annual electricity savings by 2019

MI: 1% annual savings by 2012

MN: 1.5% annual savings to 2015

OH: 22% energy savings by 2025; 7% peak reduction by 2018

WI: 1.5% electric savings and peak reduction by 2014



ME: 30% electric sales reduction and 100 MW peak by 2013

VT: ~6.75% cumulative savings, 2009-11; summer and winter peak reduction targets

MA: 2.4% annual electric savings by 2012

NY: 15% reduction from projected electric use by 2015

CT: 1.5% annual savings, 2008-11

RI: cut consumption 10% by 2022

DE: cut electricity use and peak 15% from 2007 by 2015

PA: 3% cut from projected electric use and 4.5% peak by 2013

MD: 15% per capita energy reduction and peak demand by 2015

VA: reduce electric use 10% by 2022

WV: EE & DR earn credits in A&RES

AR: 0.75% electric savings by 2013

NC: EE up to 25% of RPS to 2011

FL: 3.5% energy savings; summer and winter peak reductions by 2019

EERS by regulation or law (stand-alone)

Hybrid EERS-RPS

Energy efficiency in voluntary goal

Hybrid efficiency - renewable goal

Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew.asp

Abbreviations: A&RES – Alternative & Renewable Energy Standard; DR - demand response; EE – Energy Efficiency; RPS – Renewable Portfolio Standard

Sources: American Council for an Energy Efficient Economy, database of State Incentives for Renewables & Efficiency (dSIRE), Institute for Electric Efficiency, State regulatory and legislative sites,

Source: FERC

Also Used In Europe – Energy Efficiency Obligations

EEOs in the EU (2011)

Country	Obligated Company	Eligible Customers	Administrator
Belgium - Flanders	electricity distributors	Residential & non energy intensive industry and service	Flemish Government
France	Energy retailers & importers of transport fuels	All (including transport) except EU ETS	Government
Italy	electricity & gas distributors	All including transport	Regulator (AEEG)
GB	electricity & gas retailers	Residential only	Regulator (Ofgem)
Denmark	electricity, gas & heat distributors	All except transport or covered by EU ETS	Danish Energy Authority

Source: RAP, DG-JRC

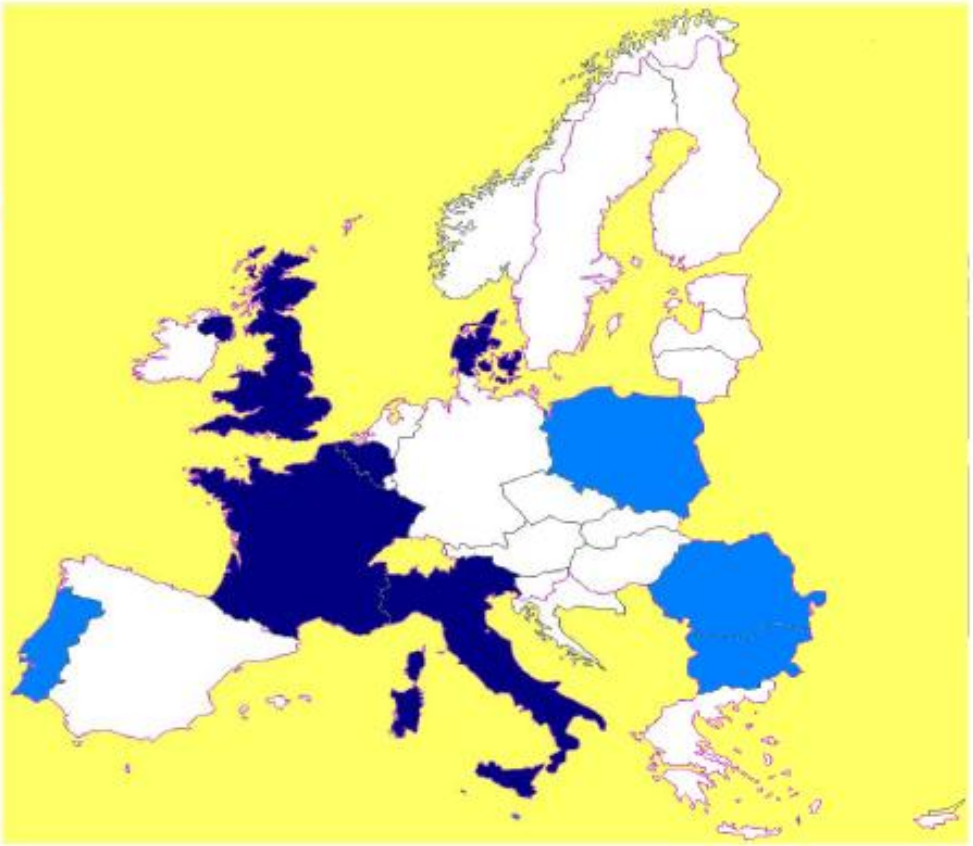
Other EU Member Stages likely to Join

Source: Heffner, IEA, 2012

5 MS "with" (Belgium, Denmark, France, Italy, United Kingdom)

5 MS on the way (Poland, Bulgaria, Romania, Malta, Portugal)

19 MS "without"

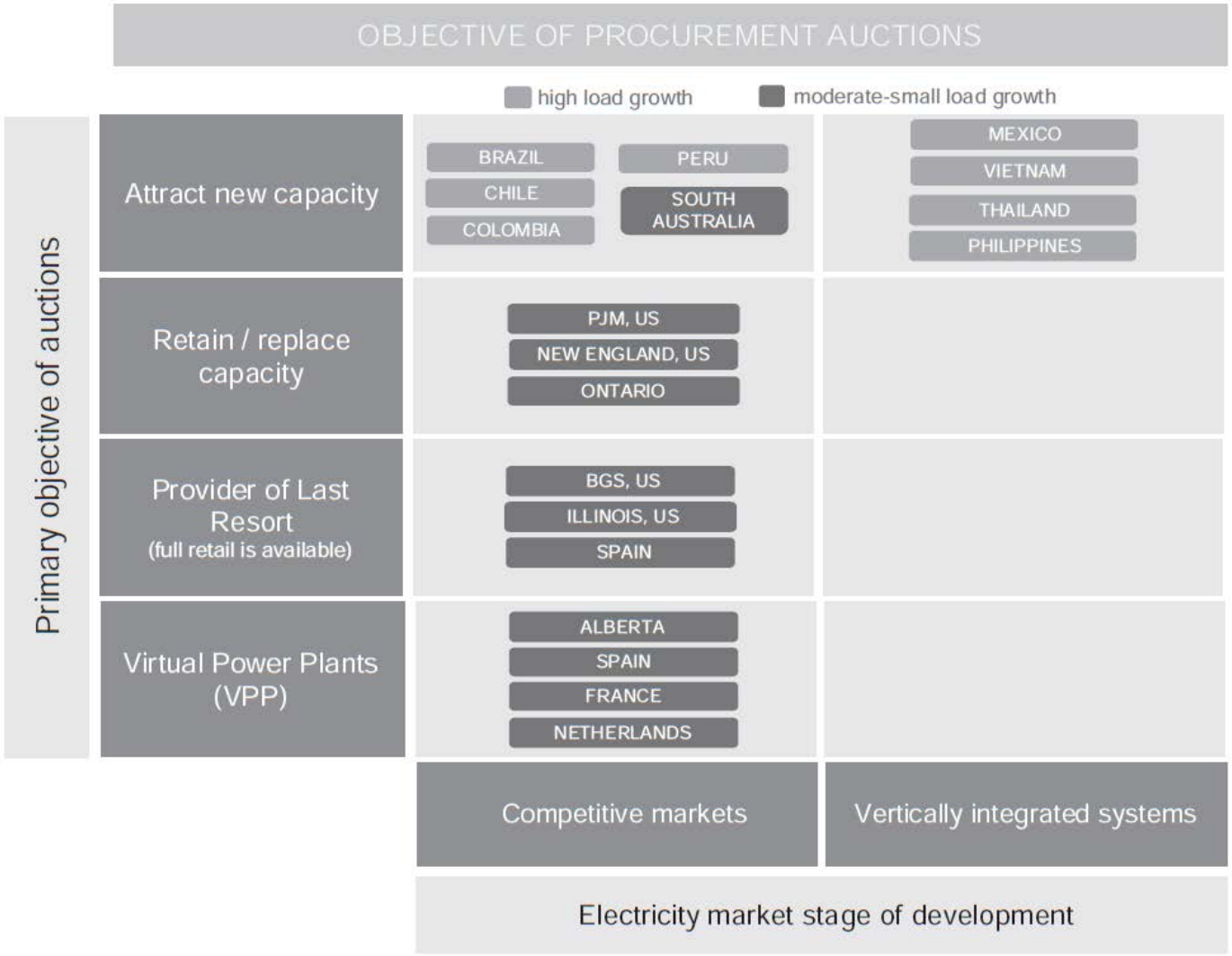


- Spain & Portugal have EE levy on energy distributor
- EU Commission now considering legislation to require a supplier mandate or levy in every Member State

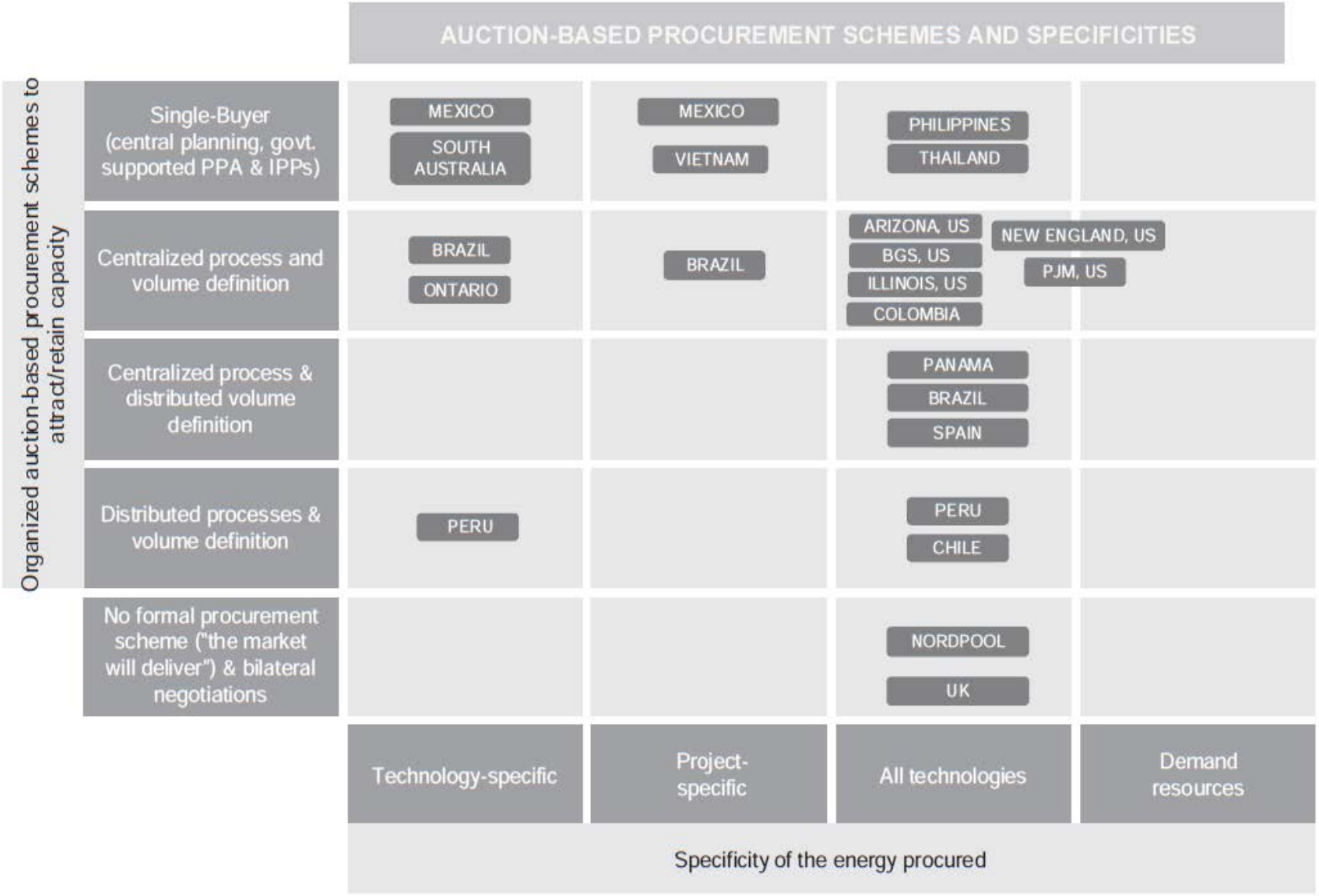
Interactions between Green and White Certificates

- So far, very little
- An empirical question, yet to be explored
- In theory, they could be interchangeable if represent similar things – e.g. GHG reduction entitlements
- But questions on “is MWh equivalent to NWh” will still remain
- Countries which are in the process of establishing quotas for GHG emissions (or energy intensity) and energy consumption quotas will face the issue of how to integrate the markets (and avoid double dipping)
- An interesting approach is Regional Greenhouse Gas Initiative (RGGI) in the Northeastern US
  - A GHG cap and trade scheme for power utilities
  - GHG emission entitlements are auctioned
  - Proceeds can be used to finance both EE and Renewables
  - Some states now challenging the mechanism

Supply side Competitive Procurement has multiple objectives



Competitive procurement - many products and suitable in multiple institutional arrangements



Mirror Image Auctions for Energy Efficiency – Is it possible?

The Missouri Department of Natural Resources utilized the Procurex, Inc. online reverse auction engine to successfully award $3 million in energy efficiency grants. Procurex, Inc. structured three consecutive one-hour auctions with 23 pre-qualified bidders. A total of $3,000,000 in grants were awarded with grant values of $100,000 (10 grants), $250,000 (4 grants), and $500,000 (2 grants)

The online reverse auction allowed pre-qualified providers to bid on $3 million in incentives on a $/kWh-saved basis for expected energy efficiency projects. Available incentive dollars were allocated based on the lowest price obtained, thus increasing the cost-effectiveness of the program and allowing the Missouri Department of Energy to spread each grant dollar further.

When all the winners fully implement their programs, Missouri could save up to 75 million kWh. As one participant in the process put it, *"That is a powerful use of reverse auction technology."*

Ian Ayres, the William K. Townsend Professor of Law at Yale Law School and writer for the New York Times blog Freakonomics, covered the historic event and said, *"Overall, across three different auctions, the average promised price-effectiveness was 3.97 cents per kilowatt-hour of saved energy." This compares favorably "to recent point estimates of the average cost of other utility energy efficiency programs, which range from 4.7 to 13.3 cents per kilowatt-hour."* (Auffhammer, Blumstein, and Fowlie, 2008).

He continued, *"For now, the great state of Missouri has shown that competitive auctions are a feasible way to get the most out of our stimulus money."*

Bret Grady, CEO of Procurex, Inc. said, *"I was quite pleased with the results that we delivered with this auction. A process that has worked so well in other categories such as energy, commodities, and services was applied very successfully for the State of Missouri. I would expect given these results that we will be running similar events for other states and municipalities looking to replicate these savings."*

FiT – Subject to Criticism? Losing Momentum?

- **BULGARIA CUTS SOLAR SUBSIDIES AGAIN AFTER UNSCHEDULED REVIEW.** The government reduced its feed-in tariffs, premium rates it pays to owner of solar plants, by 28 percent to 39 percent for projects completed after Sept. 1, (Sept. 06, 2012)
- **Greece's Energy Ministry temporarily suspended issuing licenses for new photovoltaic projects as part of measures to restore liquidity to the Greek power market.** Greece has already exceeded its 2014 target for installed capacity from photovoltaic plants of 1,500 megawatts.
- **France announced the winners of its offshore wind energy tender** that it hopes to attract EUR 7 Billion in investments and create 10,000 jobs (April 06, 2012)
- **Germany** – Environmental Ministry published a 10 point energy and environmental plan that - while emphasizing continued support to renewable energy sources – encourages a fundamental revision of the Renewable Energy Law (EEG). Among other topics, the plan focuses on the need to ensure affordable energy and keeps open the possibility of abandoning feed-in-tariffs in favor of a quota system (DB, September 2012)

Expectation that FiT may have rapid response

- **Ontario passed a legislation that created the FIT program in 2009** to boost the province's renewable electricity generation. Tariffs range from 44.3 Canadian cents per kilowatt-hour for ground-mounted solar systems of more than 10-kilowatt in size to 80.2 cents per kilowatt-hour for rooftop systems of 10-kilowatts and under. So it's not so surprising that the FIT program has attracted a lot of interest from solar project developers and equipment manufacturers around the world. "One of the main lessons we've learned is that any feed-in tariff needs a clearly defined target," said Patricia Lightburn, an analyst with the Ontario Power Authority (OPA).

- **But – Japan introduced FiT. "Rates are generous enough to stimulate investments yet may not lead to cost reduction. Long term sustainability of the program is in question" (Bloomberg May 08,2012).**
  - Wind (>20 kW) = US 28 cents
  - Solar (>10 kW) = US 50 cents

- **Japan's goals are clear** – build up extra renewable capacity, as fast as possible to deal with nuclear energy shortfall – reliability, not cost is a primary concern

Recent Examples of Auctions for Renewables

- Peru awarded developers contracts to sell power from 10 renewable energy projects using an auction system. Prices ranged from $69 a megawatt-hour for a wind farm to $119.90 for a photovoltaic solar park. That's less than half the price of power in some countries where the government sets the rates, according to Bloomberg New Energy Finance. Wind farms get 77 Euros a megawatt-hour in Spain and 82 Euros in France, both through feed-in tariff programs.
- India - Between early 2010 and March 2012, the price of solar energy in India dropped to as little as INR 7.49 per kilowatt hour or USD 0.15 USD/kWh. Much of this price decrease is due to the National Solar Mission's reverse auction bidding process, which awarded solar projects to companies with the lowest asking price. This price drop in Indian solar power means that solar could achieve price parity with coal or natural gas by 2016.
- Wind developers in Brazil were awarded contracts at an average price of 99.58 Reais ($61.99) a megawatt-hour at an auction completed Aug. 17, making it the country's cheapest source of power.
- Bids for a Uruguay auction that's still in process fell as low as $63 a megawatt-hour

FiT makes the Local Content issue more controversial

- The provisions require most renewable energy suppliers to use a minimum level of equipment produced in Ontario - 25 % for wind and 60% for solar projects
- Due to the domestic content requirements, Japan and the EU argue that the FIT is a prohibited subsidy that directly violates the Agreement on Subsidies and Countervailing Measures (SCM Agreement).
- “Through these measures, the Government of Ontario provides subsidies contingent upon the use of domestic over imported goods,” said the Japanese delegation in its statement. “This … discriminatory measure is designed to promote the production of renewable energy generation equipment in Ontario rather than to promote the generation of renewable energy.”
- “The defining aspect of FIT contracts is that they ensure renewable energy generators payments in excess of those that they would receive but for the FIT Program,” argued Tokyo when rebutting Ottawa’s claim that the programme was government procurement.
- Canada countered that the FIT programme is a form of government procurement designed to ensure the affordable generation of clean energy in Ontario. As such, the programme would be shielded from both GATT national treatment requirements
- Who is right? Ensuring affordability? Not conferring a benefit?

Is competitive bidding always feasible or desirable? I

Despite the obvious advantages, some private developers argue that competitive bidding may not always be appropriate for infrastructure projects. There are three main cases commonly raised by investors. First, some argue that organizing a competitive bidding procedure takes time and when projects are needed urgently, direct negotiations will be faster. While it is true that competitive bidding processes are relatively complex, the contention that negotiated procedures will always be faster is debatable. Examples abound of negotiations that drag on for very long periods. Besides, hastily negotiated deals may pay insufficient attention to key issues, which may emerge to haunt one or both parties later on.

Second, there may be concern that investors will not take on the often high development costs associated with preparing competitive bids for projects in smaller or more risky markets without assurance or recovering their expenses through the award of the contract. This concern is often said to be particularly true in the case of water supply concessions, where the underground nature of the assets makes due diligence difficult and costly. One response to this concern, as in the case of Buenos Aires, is to undertake a thorough evaluation of the market and underlying assets by an independent consultant before bidding is opened, making this information available to all firms who participate in the bidding process. Limiting the number of prequalified bidders to three or four also increases each candidate's chance of winning and thus their willingness to incur preparatory costs. Finally, an announced policy of reimbursing all or part of the development costs incurred in the preparation of the best non-qualified bid(s) could help attract bidders.

Is competitive bidding always feasible or desirable? I

Third, there may also be concern that private sponsors will not take the initiative to develop unsolicited proposals for private infrastructure projects if there is a risk that their labors and intellectual property will not be rewarded through the awarding of the contract. There may be a number of responses to this concern. In the Philippines, for example, a strong framework in support of competitive bidding still allows unsolicited proposals to be accepted through direct negotiation in some circumstances, including a requirement that comparative bids be solicited and, if a comparative bid is received at a lower price, the original proponent has the option of matching the price of the comparative bid and receiving the contract. It may also be possible to provide direct incentives for firms to offer unsolicited project ideas that are later adopted, without necessarily forgoing the benefits of a competitive process; after all, the firm most capable of generating innovative ideas will not always be the one that is best able to implement those ideas at least cost.

A consensus is emerging internationally in favor of competitive bidding. Exceptions should normally be limited (e.g., very small contracts and emergency situations). If it is decided to carry on with negotiated procedures, safeguards can be used to limit the risks inherent in this strategy. Among the most important are the adoption of transparent procedures and the use of external benchmarks, which provide some assurance that the conditions being offered are reasonably advantageous.

What is the World Bank Group Position?

- As a principle, WBG procurement rules have always fostered competition for goods and services – procedures are codified in great level of detail.
- However, the WBG accepts financing or providing guarantees to projects where the price for acquiring renewable energy does not result from a competitive process (or something that resembles one)
- Is this an issue of double standards? Or are there other possible reasons?
  - Is there already a policy consensus on the conditions under which competition is desirable or feasible?
  - Or because the FiT is simply considered to be transparent enough?
  - Or perhaps because some of the procurement mechanisms of electricity contracts (e.g. dynamic reverse auctions) are not yet codified in the procurement rules?
- Regulations on renewables are an evolving issue
  - Dramatic decrease in cost of renewable sources
  - Increasing experiences and successes in competitive procurement
- WBG position on competitive procurement of energy may evolve as well

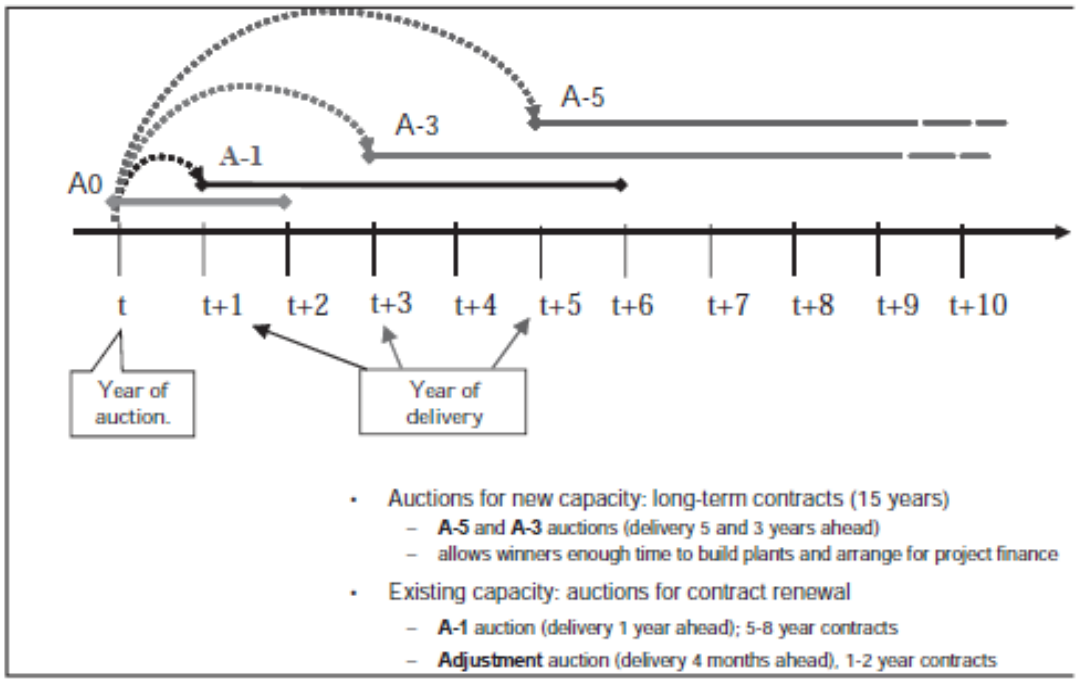
Genesis of the Auction Program in Brazil

(Source: Adapted from Barroso, WB Presentation, January 2012)

- Brazil Started with "FiT-like" program (Proinfa): three technologies, totaling 3,000 MW received a fixed price - Wind: 184 USD/MWh, SH: 96 USD/MWh, Bio: 70 USD/MWh
- Proinfa's implementation delayed several times; still not fully completed and completion postponed for the 6th time now to 2012
- Contract auctions are integrated into the regulatory framework since 2004
- Brazil runs a centralized market to auction *firm energy* contracts to contract new energy for the regulated market - Original motivation was price disclosure and efficiency in the procurement process (reduction of information asymmetry)

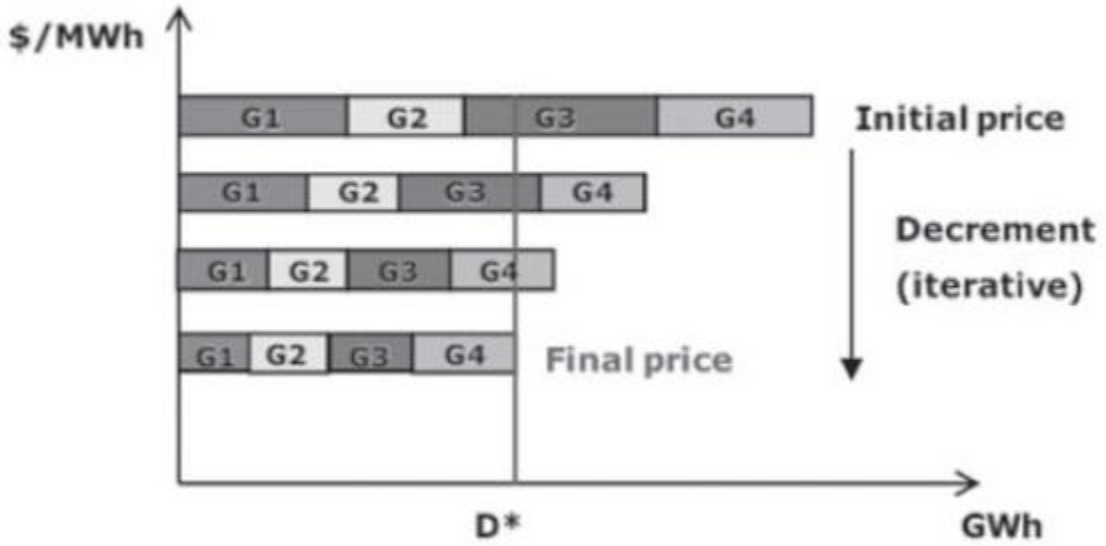
Multiple products (contracts) to create competition both “for the market” (new capacity) and “in the market (existing plants)

Figure 4.1. Energy Auctions in Brazil



General Principle – Dynamic, Descending Clock Auction

Figure 2.1. Descending Auction Dynamics



The centralized contract auctions for new capacity

(Source: Barroso, WB Presentation, January 2012)

- Regular (yearly) auctions exclusively for new energy
  - Discos declare the volumes to contract (regulated consumers pay) and a centralized procurement (economies of scale) is organized by the government
  - Standardized long-term energy contracts offered, backed by firm energy
  - Technology-neutral but the government can interfere in the candidate projects with policy decisions: For example, in project-specific auctions (e.g. large hydro), to avoid oil- and coal-fired generation as candidate supply and to contract renewable
- "Reserve energy" auctions
  - Contract *supplements* energy requirements to keep the system's security of supply
  - Government defines the volumes to contract, all consumers pay for the energy
  - Government can select the technologies that will participate, has been used to contract renewables
- Government does not take contractual positions

How to guarantee the projects will be built?

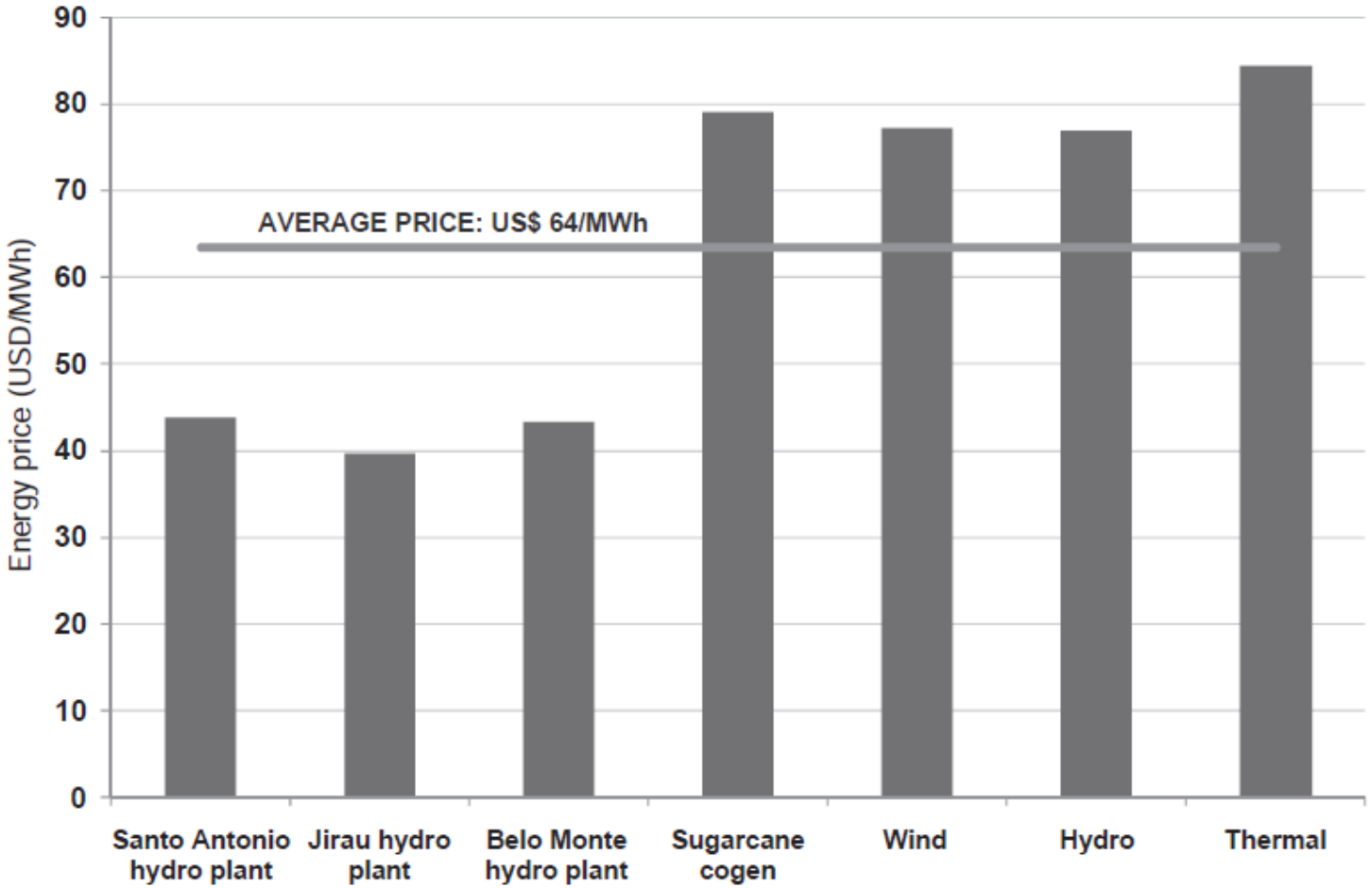
- Guarantees for new energy auctions: bid bond (1% of project's estimated investment cost) & project completion (5% of project's estimated investment cost)
- Regulator has the right to ask for contract termination if delay higher than 1 year is observed
- Several other penalties in case of delays
  - Reduction of contract price while plant is delayed
  - Depending on the auction type, it is needed to contract replacement firm energy during the delayed period (liquidated damages to buyers)

Results have been encouraging

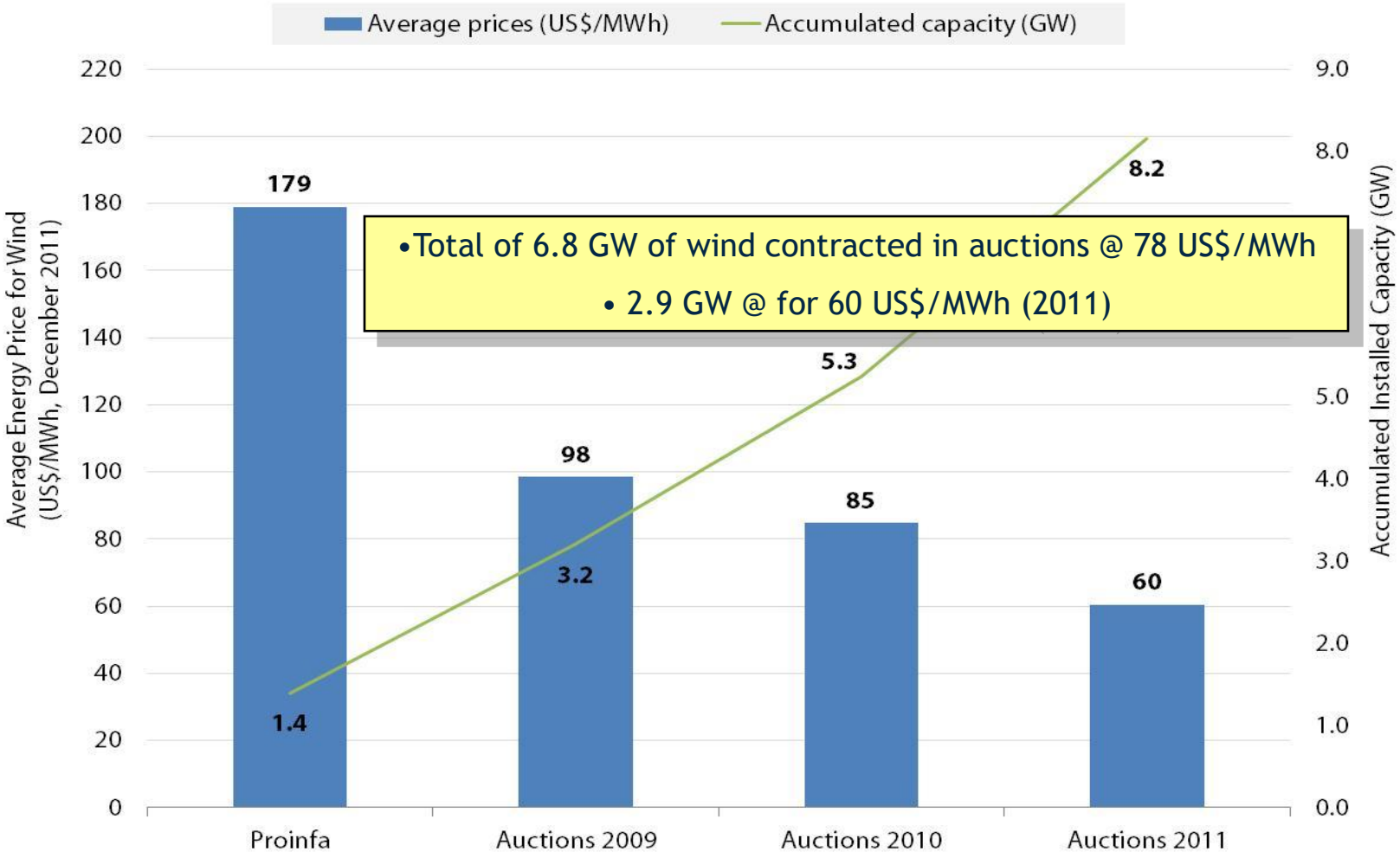
- Since 2005, these auctions have resulted in the contracting of 31 GW of new capacity
  - 40% is conventional hydro & 20% renewable (60% renewable in total)
  - 40% is fossil-fueled, mostly natural gas
  - US$ 300 billion in contracts
- Hundreds of BE, SH and wind plants, totaling 6,000 MW, are already in operation; 7,000 MW is under construction
- The “Bid but not built” criticism is not fair – and applies more to the previous regime “Fit but not built”

Average Prices – (last year non-technology specific renewable auctions- wind beat natural gas)

Figure 4.3. Results of Technology- and Site (project)-specific Auctions



Price trajectory of wind power



•PROINFA was the first RES support mechanism in the country and based on a feed-in tariff (administratively set)

•* Wind competed against small hydro and biomass

•** Wind competed against small hydro, biomass and gas-fired plants

Lessons from Auctions in Brazil

(Source: Adapted from Barroso, WB Presentation, January 2012)

- Auctions do not operate in a vacuum: they must be an integral part of a country's overall energy and procurement policies
- Fit vs. Auctions are one element of the debate – do not forget how to connect to the nearest substation (Madrigal)
- An effective auction depends on the existence of competition: attracting additional bidders are far more effective than limiting reserve prices
- Regulatory stability, transparency and the investors' perception about the fairness of the process are pre-conditions for the success of an auction
- The product offered will depend on the auction objective and is a key of the auction success (risk allocation is everything)
- Stimulus for "early warnings" of problems & delays in project implementation should be so that the "bad news" can be known in advance
- Design and implementation details matter

Final thoughts – the South African case (ongoing)

(Anton Eberhard, 2012 IFC Viewpoint, forthcoming)

Feed-in tariffs have been the most widely applied support mechanism internationally to encourage the growth of grid connected renewable energy.

But have renewable energy feed-in tariffs (REFITs) provided desirable or optimal outcomes in terms of affordable and competitive electricity prices?

Could competitive tenders or auctions offer lower prices while still providing adequate incentives for renewable energy suppliers to enter the market?

This Viewpoint looks at the recent experience of South Africa where feed-in tariffs have been abandoned in favour of competitive bids for renewable energy (REBIDs).

The initial outcomes have been encouraging: there has been a great deal of market interest and subsequent bidding rounds have seen prices fall. Could there be lessons for other countries?

Policy mechanisms are evolving as countries gain experience....No "one size fits all"

A WORLD BANK STUDY

Electricity Auctions

AN OVERVIEW OF EFFICIENT PRACTICES

Luiz T. A. Maurer
Luiz A. Barroso

THE WORLD BANK