

My wound is Argentina...

Expansion of Transmission by Market Participants in the World's First LMP Market

Disclaimer: Opinions and ideas are my own,
derived from experience under prior employers.

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Argentina: The First LMP Market

- Argentina implemented locational marginal pricing, with congestion and losses, in late 1992.
- In early 1993, I went to Argentina as part of a bid team to purchase hydroelectric plants.
 - ◆ There was no observable history, little data.
 - ◆ There were no market rules written in English.
 - ◆ There were no applicable handy industry acronyms. (ISO, LMP, FTR, etc.)
 - ◆ There were people being “truthful but not helpful.”

Learned From the First LMP Market

- Importance of *marginal losses* in LMP
- Meaning of *congestion* in an LMP market*
- Implications of congestion pricing
(violence, bloody wounds, pain, scar tissue...)
- The importance of LMP
to *Successful* Market Design

* Distinct from its meaning in the physical bilateral markets.

Learned from the First LMP Market

- Transmission enhancements *can* be brought into being by market participants guided by locational pricing signals.
 - ◆ LMP is necessary.
 - ◆ LMP is *not* sufficient.
 - ◆ FTRs may help, but FTRs are not enough.
- Market structures beyond LMP are required.
 - ◆ Specific assignment of transmission responsibilities among market participants
 - ◆ Specific, rational process for project proposal and approval
 - ◆ Regulatory mechanism for cost recovery, including allocation of costs to beneficiaries

Did Argentina pioneer Participant Funding?

- People using the term in the U.S. would likely say it does not apply to Argentina's method.
- Transmission added under Argentina's method becomes part of the regulated system.
 - ◆ Revenue Requirements recovered through tariff
 - ◆ Tariff allocates costs to beneficiaries
 - ◆ Transmission owners are not dependent on outcomes in the energy market (LMPs, FTRs)
 - ◆ Regulatory cost recovery makes projects financeable.
- The *proposal and approval process* is key.

Responsibilities of the Participants

● The Major Transmitter

- ◆ Responsible for availability of its assets
- ◆ Responsible for operating transmission system
- ◆ Participates in technical evaluation of proposed projects
- ◆ Responsible for remunerating independent transmitters

● Independent Transmitters

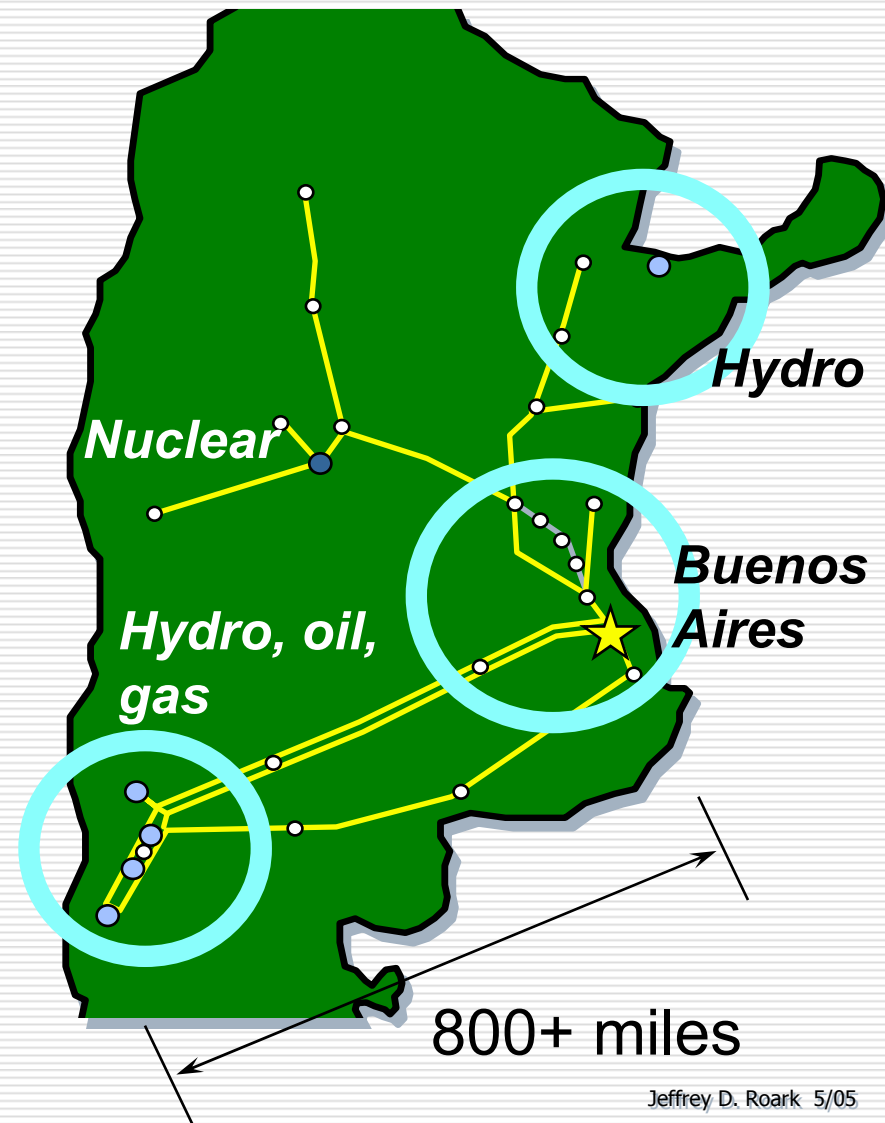
- ◆ Responsible for constructing projects to agreed-upon specifications
- ◆ Responsible for availability of their assets

● Users of the Network (Generators, LSEs, Large Consumers)

- ◆ Responsible for proposing expansion projects
- ◆ Responsible for revenue requirements from projects

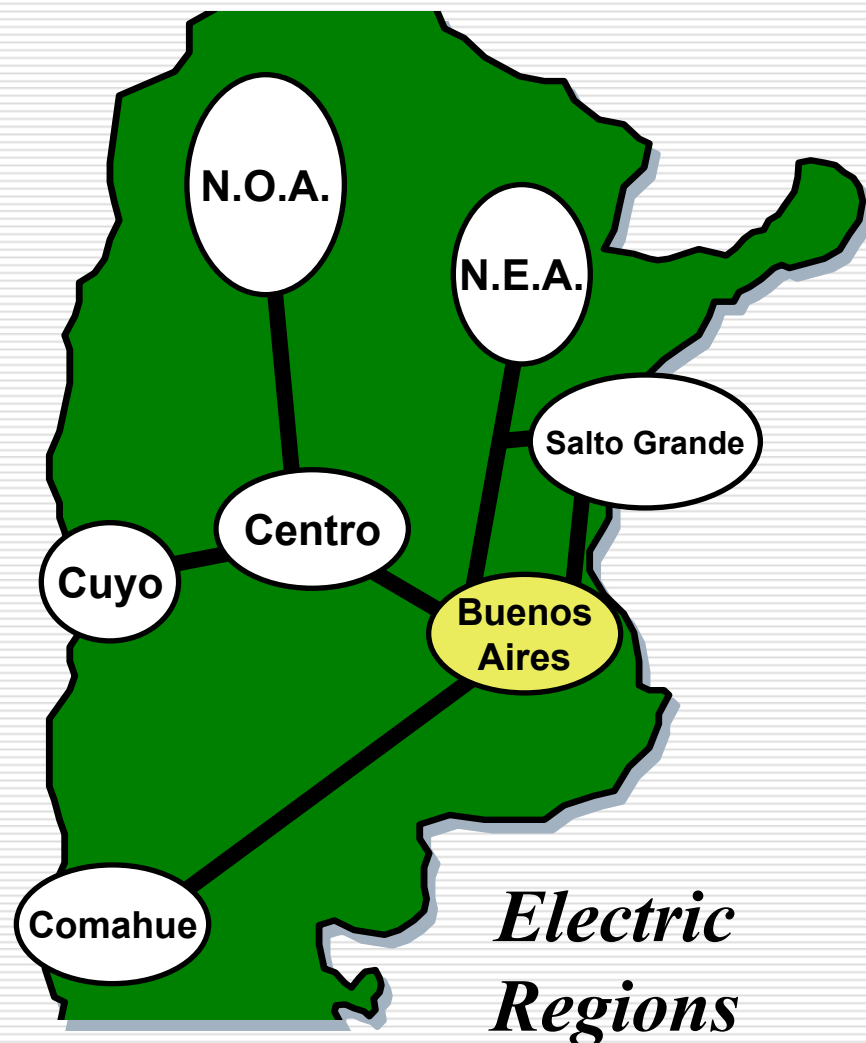
Process for Enhancing Network

- Feasibility study and full-spec proposal by market participants
- Approval study by Major Transmitter and ISO
- Determination of Beneficiaries
- Acceptance as a Project by ISO and Beneficiaries (70%)
- Project is put out for construct/own/operate bids.
- Revenue requirement allocation to Beneficiaries



Feasibility Study and Proposal

- Generators or Distributors suffer congestion costs or losses in an electric region
- Those who would benefit from an enhancement create a consortium to seek technical solutions
- Consortium commissions technical study of situation
- Proposal, complete with “design, construct, & own” bid, is submitted to ISO.
- Proposal specifies long-term annual revenue requirements.



Approval Study by Major Transmitter and ISO

- ISO studies feasibility of the proposed project.
- The ISO determines global costs/benefits, negotiates changes.
- The ISO identifies all beneficiaries of the project



Beneficiaries of a Transmission Project

- Beneficiaries are
 - ◆ producers whose energy prices will rise in response
 - ◆ distributors or users whose energy prices will drop

- Beneficiaries are important because they must
 - ◆ Agree that the project can go forward
 - ◆ Pay the fixed revenue requirements for the enhancement once it is built.

- Fixed revenue requirements are to be allocated by pro rata share of the project benefits*

* As Littlechild reports, they actually allocated by “transmission usage” rather than by “benefits.” “Usage” is a peak-load flow-based allocator that can be disproportionate to cumulative benefits.

Acceptance by ISO and Beneficiaries (70%)

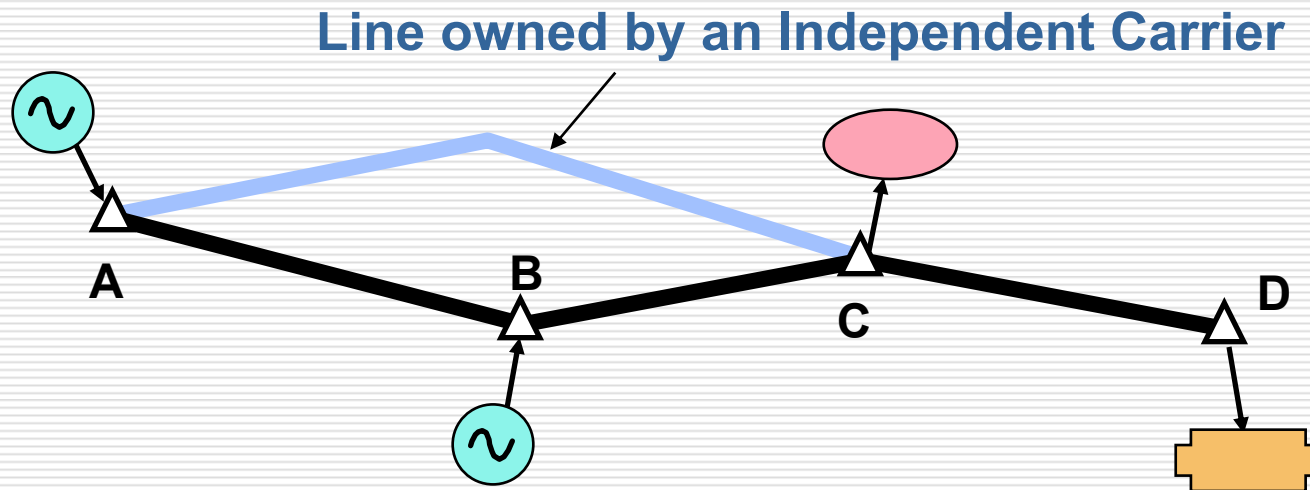
- The ISO determines global costs/benefits
- The ISO identifies all beneficiaries of the project
- **IF**
 - ◆ the project is beneficial to the system, and
 - ◆ sufficient beneficiaries (70%) agree to allow it...

then the project is officially approved.



Construction Project Put Out for Bids

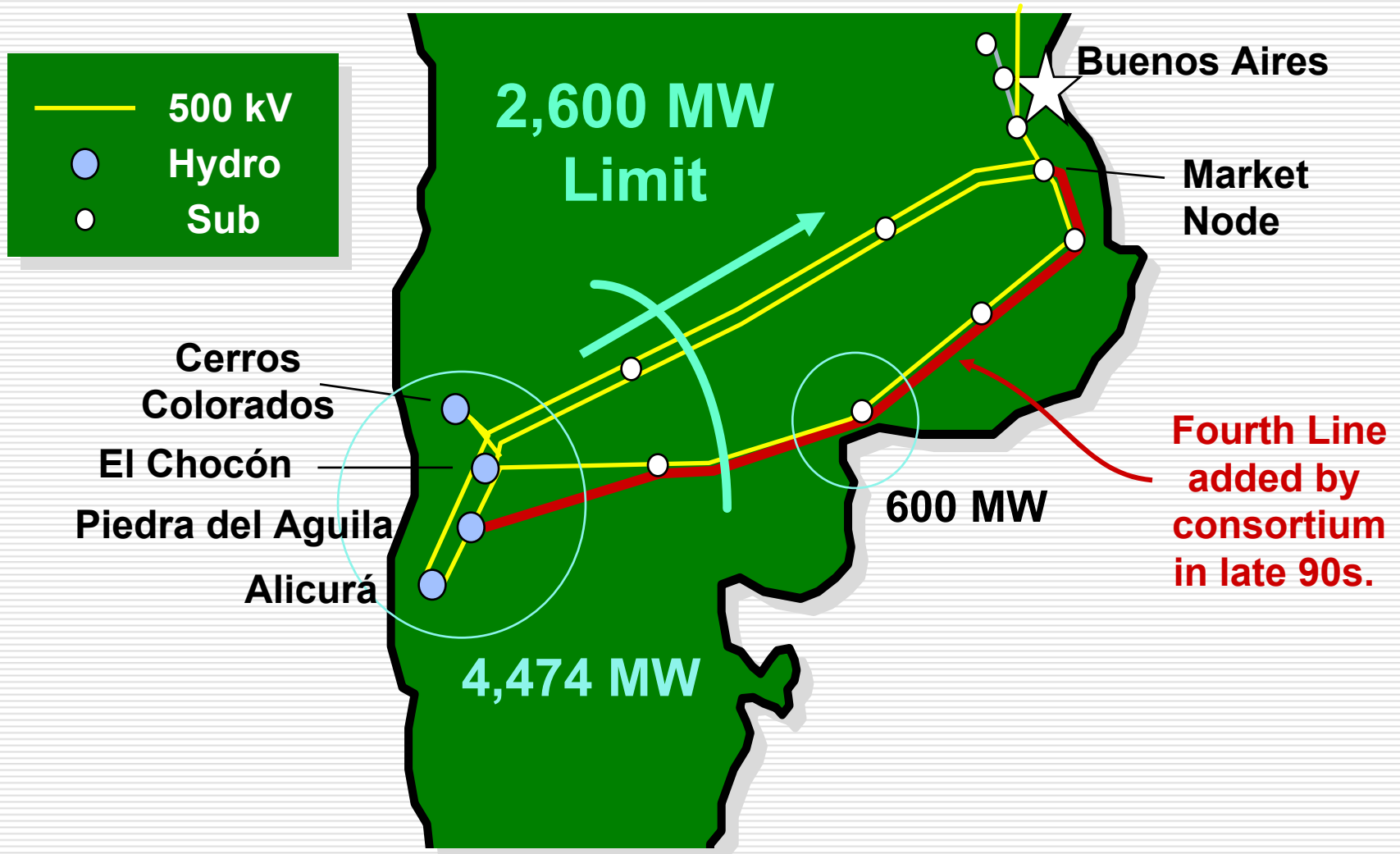
- The approved project is put out for competitive bids.
- Substitute competing projects may be proposed!
(The ISO and Transmitter will have to study competing projects.)
- The project may be built, owned, and operated by an independent party unrelated to the original consortium.



Allocation of Revenue Requirements

- The winning bid included annual revenue requirements.
- The project must perform as promised to receive full revenue requirements.
- The major transmitter collects the revenue requirements through the single system-wide tariff.
- The tariff allocates fixed costs of the transmission system to all users through a load flow method and MW-mile rates. (Note: The tariff rate/MW-mile is low relative to incremental construction.)
- The tariff likely will not cover full cost of the new project.
- The residual cost of the project is allocated directly to the project beneficiaries, pro rata to their benefits.

Comahue Transfer Limitation



Special Circumstances

- This market was designed and implemented, *then* divested by the government.
 - ◆ *Caveat emptor*: They won't change the rules for you.
- There were strange legacy inefficiencies that could be explained only anecdotally.
 - ◆ This was not a coherent optimally planned system.
 - ◆ Conversion to a market with LMP set corrective forces in motion.

Re-emphasis:

- Only beneficiaries can propose and approve projects.
- Only beneficiaries (>30%) can block a project.
- Construction procured through a competitive process.
- Recovery of revenue requirements by the project owner is contingent on availability performance, not on power flows or prices.
(Behaves very much like regulatory protection.)
- Projects can be project financed.
- No other special incentives are required.
- The ROE of a project is not known.

Difficulties with this Approach

- At first: Having market participants realize their leadership role in the process.
 - ◆ Eventually, consultants will be all over it.
- Getting agreement among beneficiaries
 - ◆ Broad consortium building is necessary
- Allocation of the benefits & costs:
 - ◆ based on forward-looking models
 - ◆ plenty of room for disagreement
 - ◆ how to re-allocate beneficiaries over time?