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SOUTH EAST EUROPE MARKET MONITORING PILOT PROJECT WORKSHOP

February 25, 2008
Budapest, Hungary

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Outline Work Shop

- Pilot Plan Experience
  - ✓ Data Collection Experience
  - ✓ Analytical Findings
  - ✓ Roundtable on Obstacles to Data Collection
  - ✓ Generation Modeling
- Market Monitoring Plan Going Forward
  - ✓ New Data Requests and Analysis
  - ✓ Institutional Framework

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Data Collection Experience

8:45 -- 9:15 AM
February 25, 2008

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Market Monitoring Findings – Data Collection

- Data Collection
  - ✓ The most notable issues involves Bulgaria ESO
    - – provided no data and virtually no explanation.
    - – We also have not located Bulgaria ATC data on the internet. This represents a fundamental departure on the part of Bulgaria from principles of transparency that are basic to the success of competitive market restructuring.
  - ✓ Some TSOs referred us to UCTE for modeling data that we use to measure loopflow and base case exchanges. We are in the process of utilizing this venue.
  - ✓ TSOs provided generator data only partially. The data that was provided was used in the network model developed by REKK.

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Data Collection Results as of December 2007

Requested Data	Transmission System Operator								
	Albania	Bulgaria	Bosnia & Herzegovina	Croatia	Macedonia	Montenegro	Romania	Serbia	UNMIK
Hourly Load	✓	**no**	✓	✓	✓	✓	✓	✓	✓
Interconnection Flow	✓	**no**	✓	✓	✓	✓	✓	*Note 6*	✓
Generator Capacity Data									
Unit Rating	✓	**no**	✓	✓	✓	✓	*Note 5*	✓	✓
Outage Rating	✓	**no**	*Note 2*	*Note 3*	✓	**no**	*Note 5*	**no**	✓
Generator Operating Data									
Heatrate	*Note 1*	**no**	*Note 2*	*Note 3*	*Note 4*	**no**	*Note 5*	*Note 7*	**no**
Startup Cost	*Note 1*	**no**	*Note 2*	*Note 3*	*Note 4*	**no**	*Note 5*	*Note 7*	**no**
Fuel Cost	*Note 1*	**no**	*Note 2*	*Note 3*	*Note 4*	**no**	*Note 5*	*Note 7*	✓
Contractual Obligations	✓	**no**	*Note 2*	*Note 3*	*Note 4*	**no**	*Note 5*	*Note 7*	**no**
Congestion Mgmt Actions	✓	**no**	✓	**no**	✓	✓	✓	✓	n/a
NTC and ATC	✓	**no**	✓	✓	✓	✓	✓	✓	n/a
Base Case Data	✓	**no**	✓	*Note 3*	✓	✓	✓	*Note 6*	n/a

Note 1 : Albania has only hydroelectric capacity in operaiton, therefore these data are not applicable; Note 2: TSO claims confidentiality by generator; *Note 3* : TSO directed us to market operator and UCTE; *Note 4* : TSO does not have data; Note 5: TSO claims confidentiality by generator; *Note 6* : TSO referred us to UCTE; *Note 7* : TSO claims confidentiality by generator;

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Quarterly Report Analysis

9:15 – 10:30AM
February 25, 2008

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Key Findings

- Regional Prices
  - ✓ Track regional price trends, including comparison between Austria and SEE
- Congestion
  - ✓ ATC and real-time congestion management
- Interconnection Capacity Evaluation
  - ✓ Evaluates flows versus reservations
- Regional Network Modeling
  - ✓ Benchmark case
- Variation in NTC
  - ✓ variation not explained by outages and/or seasonal changes

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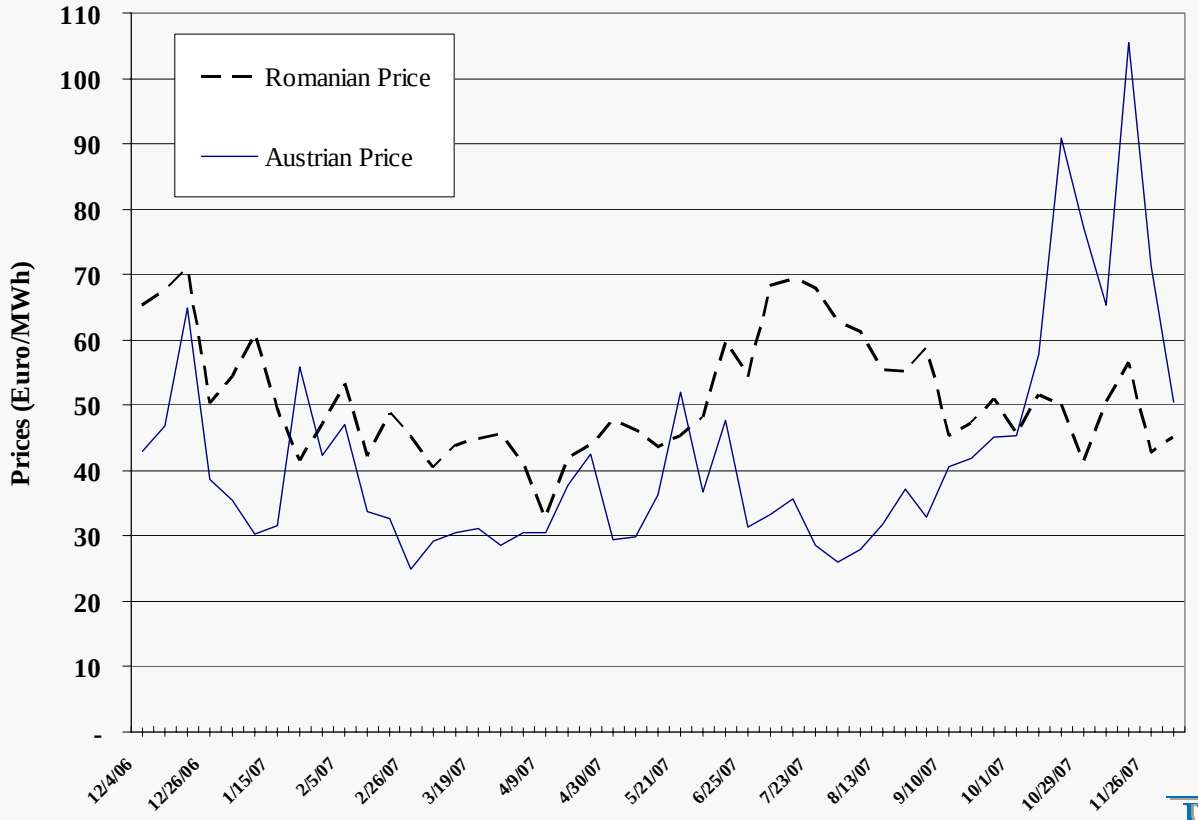
Day Ahead Prices Romania v. Austria
Weekly Average December 2006-November 2007



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Congestion

- ATC is frequently zero on the following interconnections during the period December 2006 to August 2007
  - ✓ Montenegro to Serbia (9 of 12 months)
  - ✓ Albania to Serbia (8 of 12 months)
  - ✓ Macedonia to Serbia (5 of 12 months)
  - ✓ Romania to Serbia (5 of 12 months)
  - ✓ Serbia to Albania (5 of 12 months)
  - ✓ Serbia to Croatia (5 of 12 months)
- Real-time congestion management measures rarely occur

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Interconnection Capacity Evaluation

- **Purpose: To compare actual usage to reserved usage**
- Availability of interconnection capacity is a critical market monitoring focus.
- We evaluated allocated capacity (AAC) versus actual usage of facilities (interconnection flows);
- The true relationship between AAC and actual usage is complex and the analysis is meant as a screen, not as a precise comparison;
- Initially we simply compared allocated capacity to interconnection flow;
  - ✓ Realizing important elements were not reflected, we made revisions

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Interconnection Capacity Evaluation

- We subsequently made analysis more precise by accounting for:
  - ✓ Base Case Exchanges
  - ✓ Loop flow;
- In particular, we calculated a "net flow" by taking actual flow and Subtracting:
  - base case exchange (BCE) indicated between two countries, and
  - Loop flow (based on "natural flow" value in monthly base case model used for Capacity Assessment)

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Interconnection Capacity Evaluation

- The analysis was still a “rough” comparison for two reasons:
- Base case exchanges do not flow 100% over interconnection between two TSOs.
- AAC, if it is nominated, does not flow 100% between two TSOs;
- We introduce Power Transmission Distribution Factors (PTDFs) into our analysis.
- PTDF indicates what portion of a transfer from one TSO to another TSO flows over the various interconnections in SEE.
- For example, only 64% of a transfer from Serbia to Montenegro actual flows on the Serbia-Montenegro interconnection; 17% of it would flow to Croatia and almost 10% to Romania.

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Interconnection Capacity Evaluation

- We used PTDF to adjust the analysis in two ways
- 1. We calculated the flow on each interconnection that would result from the base case transfer as they would actually flow, not just on the interconnection between two TSOs;
- 2. We estimated what amount of power would flow on each interconnection if all AAC was nominated.
  - ✓ We did not account for counterflow, under the theory that TSO cannot count on counterflow.
- Ideally, we would secure nomination data in order to directly compare reservation usage; Nomination data would also allow a analysis of the regional NTC efficiency.

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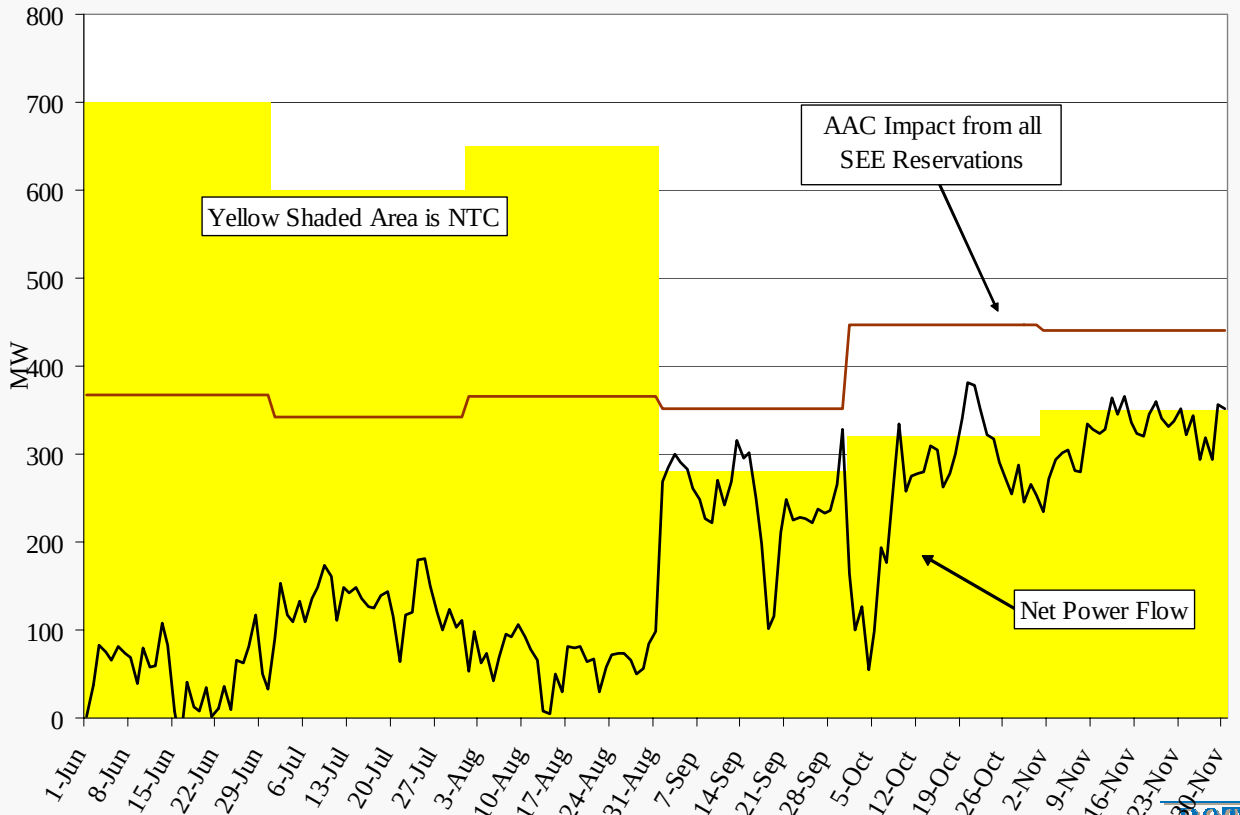
Example of Interconnection Analysis Using PTDFs
Serbia to Macedonia



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Pilot Plan Options Going Forward

2:45 PM – 5 PM
February 25, 2008

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Outline of Issues Going Forward

- Continuation of Pilot Plan;
- Additional Data Requirements for Further Development of Pilot Plan;
- Functional Location -- who will administer plan?
- Functional Form – who will perform the monitoring?
- Geographical location – where will the function be located?
- Term of Project – how long will the project last?

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Continuation of Pilot Plan

- Experience indicates market monitoring function should be in place prior to full market opening; This favors continuing the current Pilot in preparation for development of competitive structure;
  - ✓ Continue data collection and Quarterly Reporting
  - ✓ Begin Developing New Market Monitoring Plan Based on experience in Pilot Plan
  - ✓ Multiple Step Process:
    - Incorporate input from Budapest meeting
    - Seek input from donors, EC Secretariat; ECRB;
    - Present to Athens Forum

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Additional Data Requirements

- Extend data requirements to reflect what would be needed in a full monitoring projects
- Some have been requested before and are not available from TSO so the request must expand beyond TSOs
- Additional data Requirements are in two broad areas:
  - ✓ data on NTC/AAC calculations
  - ✓ generator data

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New Data Request to TSOs

- Base case model used to estimate NTC;
  - ✓ We request not only results, but inputs such as load, generation, transmission ratings; This is typically available in a single file from which we can extract relevant data;

- Details on daily transmission nominations
  - ✓ This data would help to better determine whether allocated capacity is being nominated. Our current analysis observes only reservation (AAC) and actual flows. The nominations would help clarify the usage.

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New Data Request to TSOs (continued)

- Full generator capacity and operating characteristics, including hourly output; rated capacity; technology; fuel, and heatrate;
  - ✓ The dispatch of generating units can have a significant impact on the usage of transmission capacity. Unjustified departure from least-cost dispatch can cause congestion that can be subsequently exploited by generators. We can check the instances of out-of-merit dispatch and determine whether the event may have caused congestion;
- Bilateral contract terms
  - ✓ Our experience so far has indicated that TSOs generally do not have access to key bilateral contract data. We wish to continue our work in finding ways to make this data available.

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Functional Location of Monitoring

- Permanent Monitoring could be located in
  - ✓ Option 1: Central Auction Office under ECRB auspices
  - ✓ Option 2: ECRB
  - ✓ Option 3: Energy Secretariat
  - ✓ Option 4: Independent Entity under agreement among SEE country regulators
  - ✓ Option 5: Independent entity under current donor-support
  - ✓ Option 6: Donor-contractor working for a two year transition under the ECRB in collaboration with the ECRB "Staff" which are staff members of the Energy Community Secretariat.
  - ✓

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Functional Form and Physical location of Monitoring

- Functional Form
  - ✓ Virtual Option, remote contractors (as is the current form)
  - ✓ "In-house" market monitoring unit within the organizational structure of main agency, e.g., COA, ECRB;
- Physical Location
  - ✓ Within SEE or in an adjacent, non-SEE country
- Staff qualifications and Training
  - ✓ Engineers, esp., with experience in SEE TSO
  - ✓ Former Traders

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