

# ***Monitoring and assessing operation of the regional electricity market, congestion management in the region and solving cross-border disputes***

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## Legal basis for cross-border issues in EU

- ▶ Legal basis for cross-border issues defined within EU Legislation:
  - ◆ Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity
  - ◆ Regulation (EC) No 1228/2003 of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity (up until March 2011)
  - ◆ REGULATION (EC) No 714/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003
- ▶ EU Legislation implementation within SEE Region (for Contracting Parties): CPs signing the Energy Community Treaty
- ▶ Task for CPs: Transposition of EU Legislation provisions within local/national CPs legislation

## Inter TSO Compensation (ITC) mechanism

- Establish one single ITC mechanism within EU
- Single EU-SEE ITC fund was created in June 2007
- Monitor ITC process
- Cooperation with ETSO/SETSO TF
- Looking forward for ITC Guidelines

### **Regulatory role:**

- Define loss prices to calculate value of transit losses (each year for the following year)
- Infrastructure costs, value of assets based on regulated costs as covered by national tariffs
- Commenting proposed (signed) ITC Agreement



## ETSO/ENTSO-E ITC Agreements

- ITC Clearing and Settlement Agreement signed by TSOs
- Deadline for regulatory complaints was prescribed by ITC Agreement-approval
- ENTSO-E put in place an enduring inter-TSO compensation mechanism
- On 3 March 2011 a new, legally binding Inter TSO Compensation (ITC) Mechanism entered into force
- It has been signed by ENTSO-E and 39 Transmission System Operators from 34 countries in line with the requirements of new EC Guidelines (Regulation (EU) No 838/2010)
- The ITC contract is now a multiyear agreement, and replaces the previous voluntary agreement
- URL: [www.entsoe.net](http://www.entsoe.net)

## ACER Electricity Regional Initiatives

- ▶ EU-ACER: 7 Electricity Regions defined (ex-ERGEG)
- ▶ Each Region is represented by the Leading Regulator within ERI
- ▶ Each Region has its RCC: discussion floor for regulators
- ▶ Each Region chose its own way forward regarding cross-border capacity allocation mechanism (coordinated auctions, market coupling, etc.), which is in line with the Regulation (3<sup>rd</sup> Package)
- ▶ Each Region defined its Regional Action Plan regarding cross-border capacity mechanism
- ▶ Elaboration of the Cross Regional Action Plan, which would define common principles regarding cross-border issues on pan-European level and thus facilitate achieving of EU Target Market Model in 2014

## WB WMO Study for SEE Region

- SEE Regulators' cooperated very closely with the Consultants POYRY/NordPool on the Interim Reports + discussions with TSOs, Regulators, Ministries, Traders and Industry
- **Final version** of the WMO Study was submitted to SEE Regulators (EWG) in late April 2010
- Consultants accepted most of regulatory concerns for SEE region
- Consultant's proposal based on gradual transition of big industrial consumers from tariff to eligibility exercising consumers
- Consultants ready to assist on implementation steps: WB provided Consultants' further support to EWG within Implementation phase:
  - Regulators'/EWG role, ECRB role, MC role- in implementation
  - Feasibility of the Consultants' proposal
  - Realistic deadlines for implementation

## SEE Regulators' feedback on WMO process in SEE Region

- ◆ It is necessary to take an efficient **Step-by-step** approach when introducing WMO in the 8<sup>th</sup> Region
- ◆ WMO is mainly driven by **political influence** and **national strategies** !
  - Regulators could just **support** WMO and **propose** solutions, but cannot decide or make strong influence to decisions
- ◆ **Regulators** are supposed to **implement** the **recommendations** into their **market models**
- ◆ Regulators addressed the fact that the **willingness of regulators** to adapt their systems was **not the key problem**, but **limitations** related to **their powers** and **acceptance by governments** would exist
- ◆ Regulators should more actively **raise the restriction of powers** they are facing
- ◆ Ministries representatives and **Governments** to be **much more involved** in the **implementation phase**, as they are **key elements** and most responsible entities for **accelerating** wholesale market **opening** in the eight region
- ◆ **SEE regulators support WMO process, advice** and work on creating an appropriate regulatory framework for the proposed solutions



## WB WMO Study: Implementation phase

- CPs should be responsible for elaborating National Action Plans (by Ministries, TSOs, NRAs and Power Exchanges, if applicable), based on Regional Action Plan
- Any guidance received from PHLG and Consultants' proposal for National Action Plans is welcome
- **All ECRB EWG members supported SEE RAP Draft** at the meeting (April 2011) with minor changes which were introduced in the final RAP Draft
- EWG members of **Moldova** and **Ukraine** fully **supported RAP Draft**, but informed that they will **not be able to implement** it due to **technical problems** as their power systems are not synchronized with ENTSO-E interconnection, and their TSOs are not involved in the ENTSO-E and related processes: Note included in SEE RAP
- Decision: Moldova and Ukraine to be involved in the gap analysis to be produced additionally by the Consultants - to include Moldova and Ukraine gap analysis in the WMO Study

## SEE RAP: Cooperation with ACER ERI

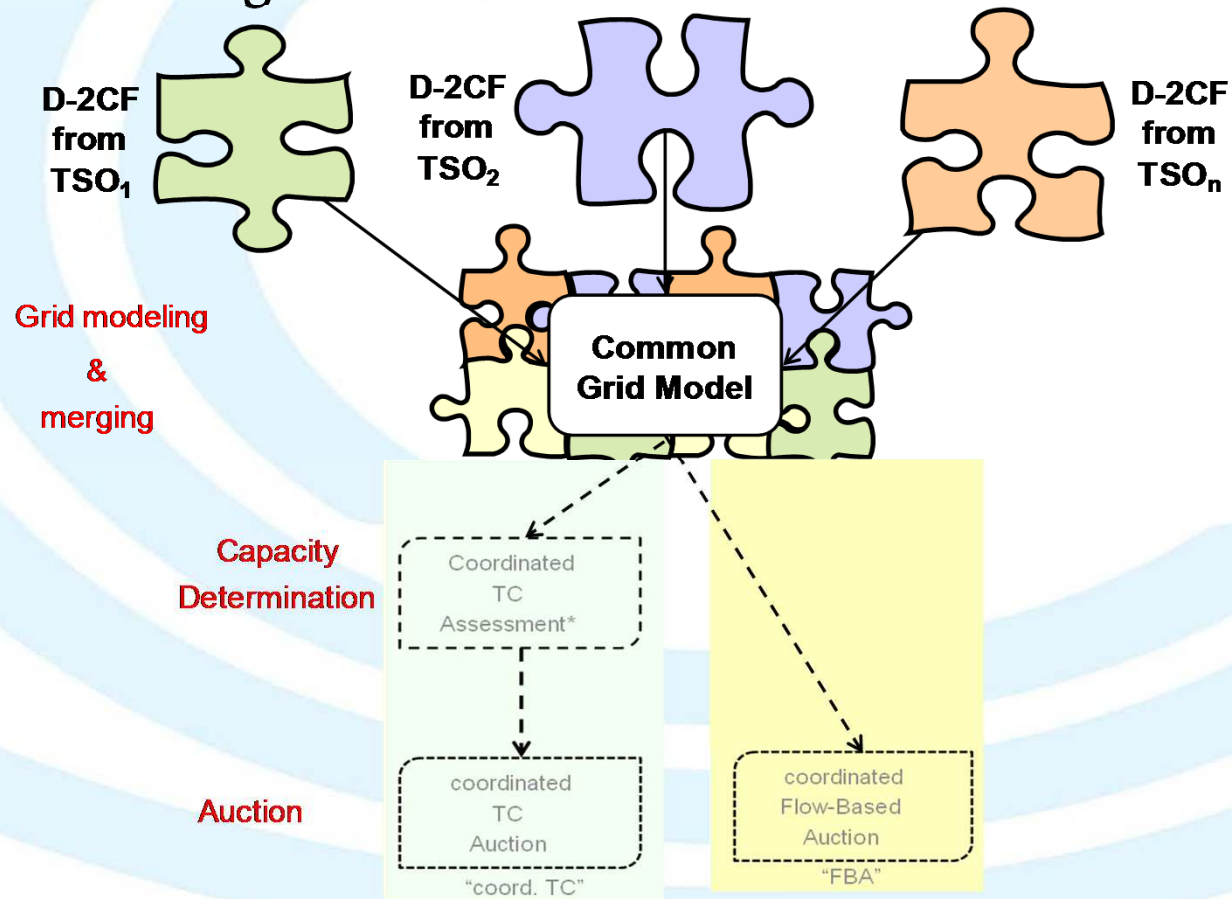
- ACER Coordination Group for ERI: ECRB represented unofficially at these meetings
- Positive signal: The 8<sup>th</sup> Region included in the ERI Draft Agenda meetings under topic Revision of consistency among Regional Action Plans
- Required presentation of the Revised Regional Action Plan for SEE
- ECRB-S has submitted SEE RAP Draft to ACER for their evaluation (17 June 2011) before the 17<sup>th</sup> ECRB meeting
  - Presentation of required revised SEE RAP (coherence between 8 E RIs)

## SEE RAP Document Structure

- SEE RAP structure comparable to FG structure:
  - CAPACITY CALCULATION
  - FORWARD CAPACITY MARKETS
  - DAY-AHEAD MARKET
  - CROSS-BORDER INTRADAY MARKET AND BALANCING MECHANISM

# Capacity Calculation

- ▶ Development of common grid model and coordinated capacity calculation method in the SEE region in line with the EU Target Model





## Forward Capacity Market

- Step by step (“glide-path”) approach
- Implementation of coordinated bilateral explicit auctions in the SEE Region
- Establishment of multilateral coordinated (NTC based) explicit auctions on several borders (based on technical and organizational feasibility)
- Establishment of centralized multilateral coordinated (NTC-based in a first step, flow based method is still under consideration) auctions on most of SEE borders
- Multilateral coordinated auctions on all borders within the SEE region (regional one-stop-shop or EU-wide solution)

# Forward Capacity Market

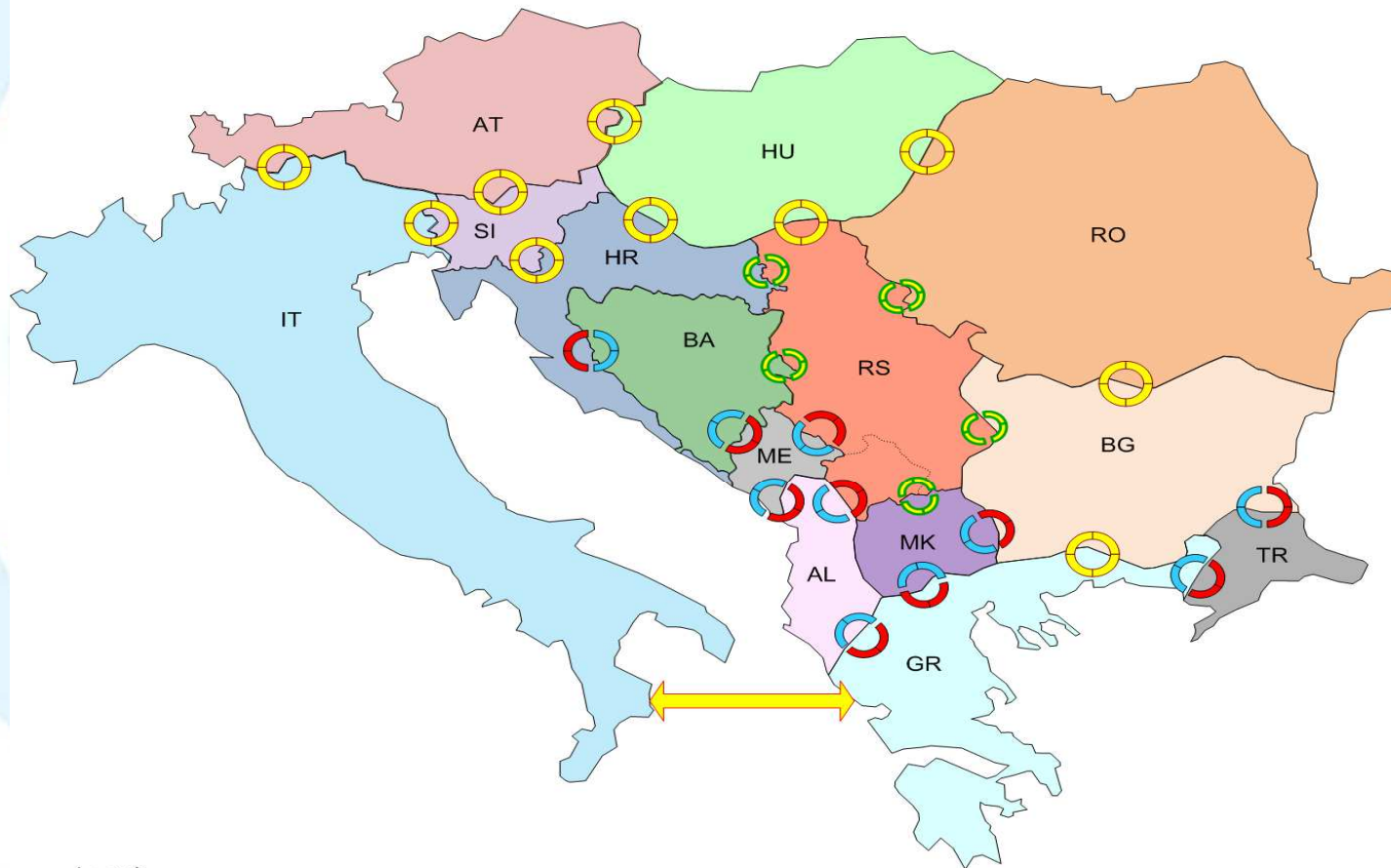
MONTHLY ALLOCATION in SEE (September'10)






Legend:  
 EA Joint  
 EA Split

# Forward Capacity Market

MONTHLY ALLOCATION in SEE (September'11)

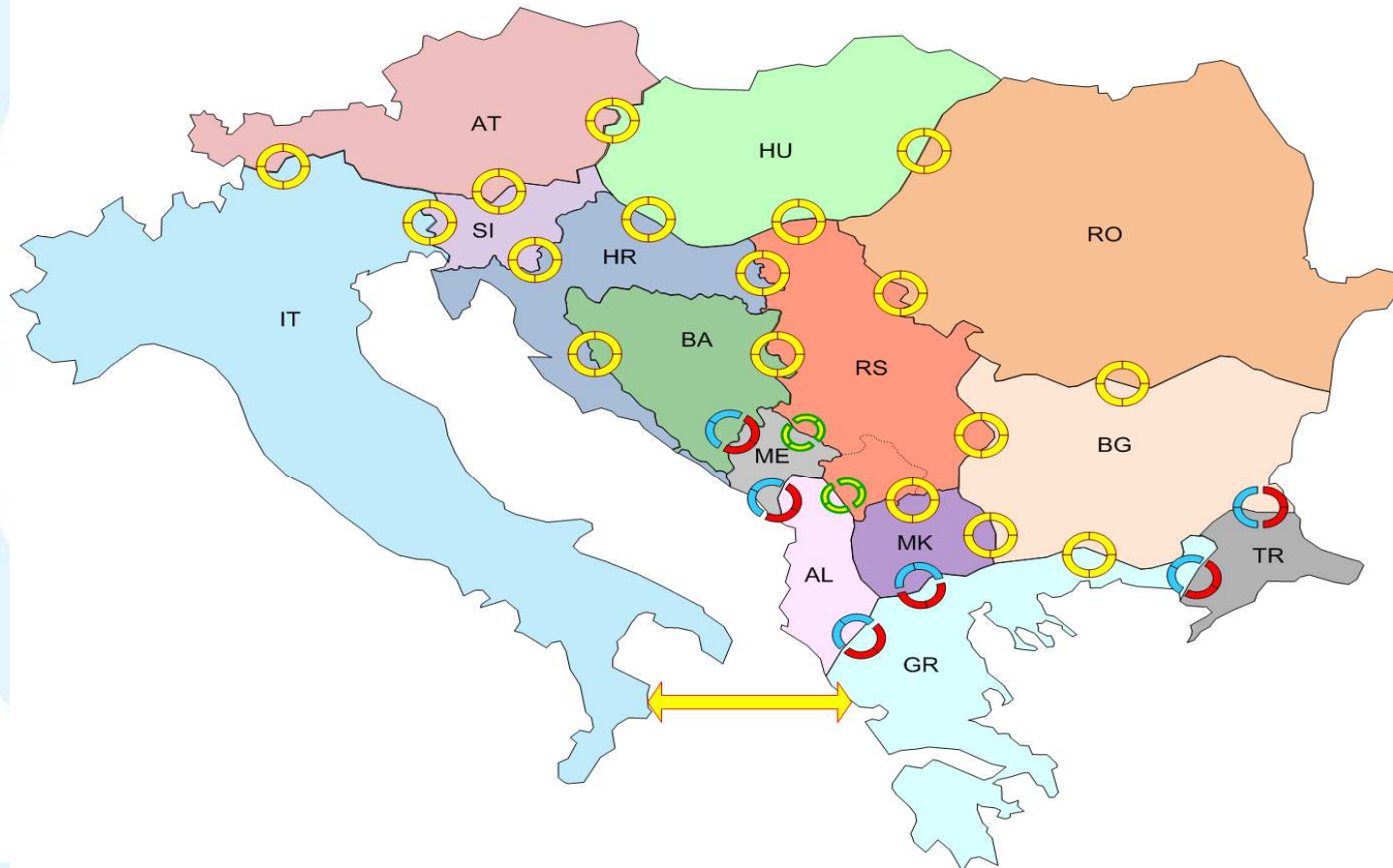





Legend:

-  EA Joint
-  EA Split- negotiation for Joint
-  EA Split

# Forward Capacity Market

MONTHLY ALLOCATION in SEE (PLAN MID 2012)



- Legend:
-  EA Joint
  -  EA Split-negotiation for Joint
  -  EA Split



## Day-Ahead Market




- Price Based Market Coupling as Target Model for SEE DAM
- Staged Implementation of the Regional DAM
- Parallel Development of Regional and Local Electricity Markets
- Bilateral/ trilateral market coupling in the SEE region (nucleus approach or different regional initiatives)
- Integration with neighbouring regions/markets
- Pan-European market coupling including the SEE region operational

# Day-Ahead Market - Explicit

DAILY (D-1) ALLOCATION in SEE (September'10)



Legend:

-  EA Joint
-  EA Split
-  EA Split - one TSO

# Day-Ahead Market - Explicit

DAILY (D-1) ALLOCATION in SEE (September'11)



# Day-Ahead Market - Explicit

DAILY (D-1) ALLOCATION in SEE (PLAN MID 2012)



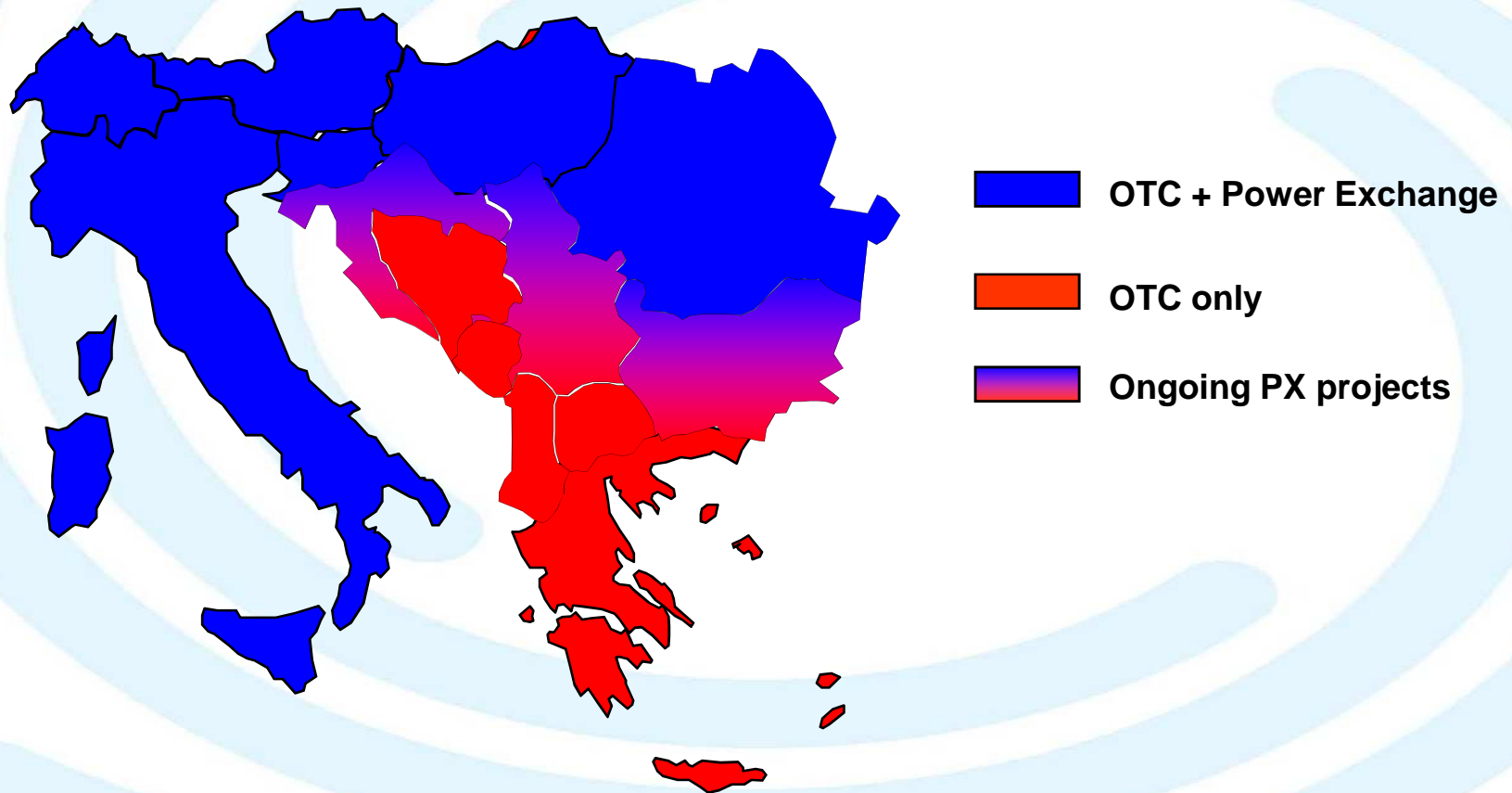
Legend:

- IA Joint
- EA Joint
- Under negotiation
- EA Split
- EA Split- one TSO



# Day-Ahead Market - Implicit

## ▶ Ongoing initiatives



## XB Intraday Market

- Common regional solution for XB Intraday Market
- First step as simple as possible (FCFS or pro-rata)
- Interim step of sub-regional integration before implementing an entirely regional solution (market integration would start with a nucleus consisting of two to three jurisdictions)
- Final solution in line with EU Target Model (continuous trading)
- XB Balancing Market
- Investigation of the options for integration of national balancing mechanisms (taking into consideration timeframe and results achieved on ENTSO-E level)
- TSO-TSO mechanism without common merit-order list as an interim solution
- Final solution – XB Balancing mechanism with common MO list

# XB Intraday Market

INTRADAY in SEE (2011)



# XB Intraday Market

INTRADAY in SEE (PLAN MID 2012)



**Legend:**  
 Auction  
 FCFS



# Governance

## **Top-Down Guidance:**

- European regulation, Framework Guidelines on CACM, Network Codes

## **Governance within the SEE Region:**

- MC (supported with PHLG) - general policy guidance to the process and harmonization of the national legal and regulatory frameworks
- ECRB - harmonization of market rules and network codes, regional market monitoring process
- ENTSO-E RG SEE – development of the regionally coordinated CACM mechanism and harmonization with the corresponding EU-wide mechanism
- EC Secretariat - support to the Energy Community institutions in the Treaty implementation process

## **Governance at Local Level:**

- Development and implementation of the Local Action Plans

## The 8<sup>th</sup> Congestion Management Region (SEE)

- ▶ The most pressing issue was the **pending definition** of a **Congestion Management area in the South East European region - Prerequisite for SEE CAO establishment** was creation of the 8<sup>th</sup> Region and definition of consisting countries
- ▶ The need of a definition for South East Europe region became evident during the Action Plan drafting process for the CAO as Regulation 1228/2003 and its Congestion Management Guidelines consists no definition for SEE region
- ▶ At the same time, the definition is essential for the SEE CAO project as it **predefines the future participants of the CAO**
- ▶ The so called 8<sup>th</sup> Congestion Management Region was established according to the approach used within the EU (ERGEG Electricity Regional Initiatives) by the agreement/**decision** reached at the **Ministerial Council** in June 2008



# A Project Overview : The 8<sup>th</sup> Region

▶ As a result a **common Coordinated Congestion Management method**, including capacity allocation, is to apply for the **following territories**:

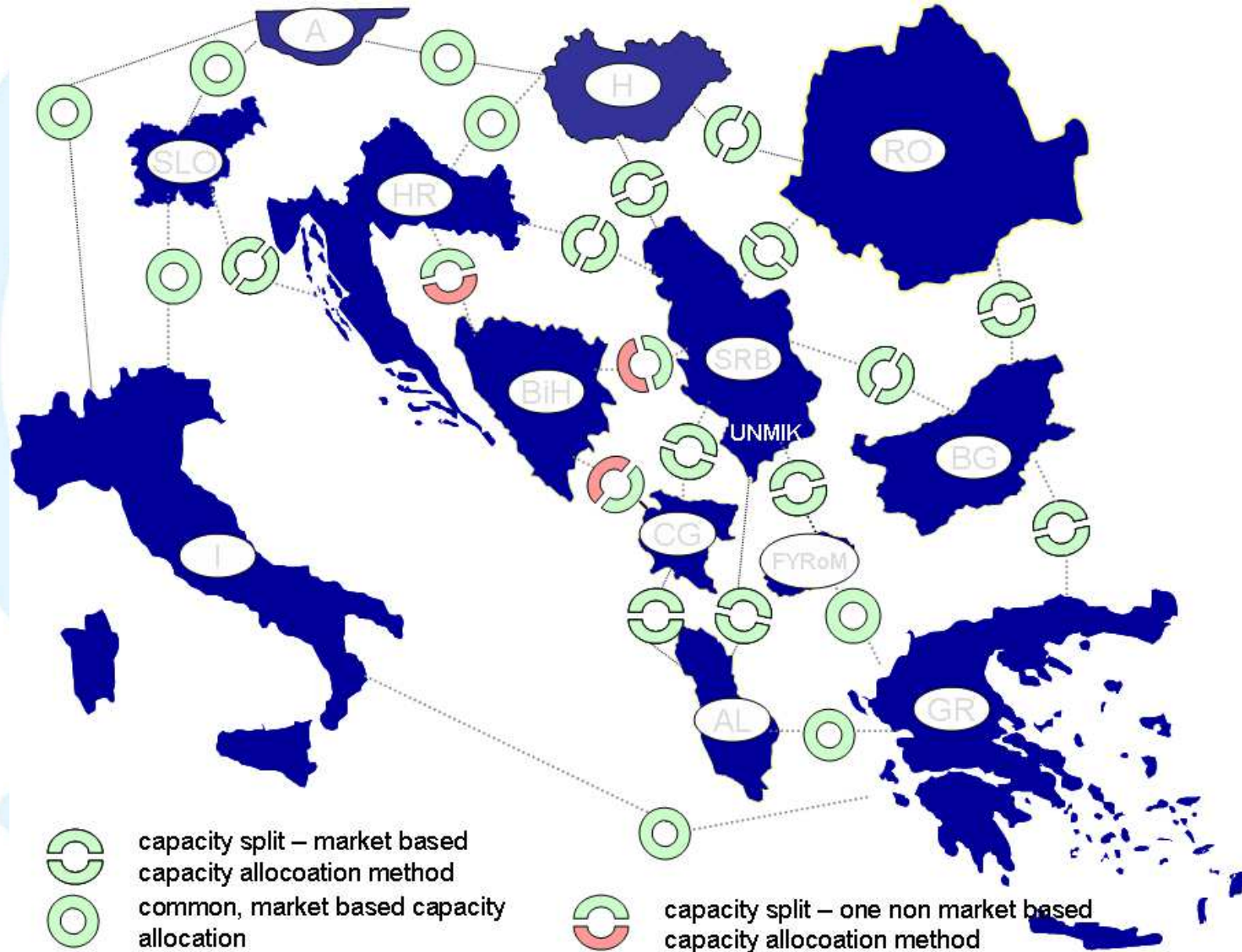
- the nine Energy Community Treaty Contracting Parties
- the neighboring countries Bulgaria, Greece, Hungary, Romania and Slovenia
- Italy with regard to the interconnections between Italy and the Contracting Parties to the EnC Treaty (DC undersea cables)
- Austria, as an important supporter of the SEE Coordinated Auction Office project got an observer status



<b>SEE</b>
<b>13 contracting parties</b>
<b>24 borders</b>
<b>Population: 137,12 million</b>



# Congestion Management in SEE Region





## Congestion Management in SEE: Compliance with Regulation 1228/03 and CMG

- ▶ SEE national transmission systems are **faced** with a **complex** international electricity **market, transits** and a growing **number** of market participants
- ▶ Thus Cross-Border **congestions occur** and create a **barrier** for international electricity trade within SEE (North → South)
- ▶ Therefore it was **necessary** to **implement** proper **rules** for **Market-based** Congestion Management
- ▶ The **Basic principles** for Cross-Border Congestion Management are described in the **Regulation (EC) 1228/2003 (714/2009)** and **CMG**
- ▶ Regulation 1228/2003 (714/2009) is **applicable** in the SEE Region through the **Energy Community Treaty**
- ▶ SEE Region is working on **Flow-base explicit coordinated auction scheme** since 2004 (dry-run) involving TSOs, regulators and traders

## Coordinated Explicit Flow-based Auctions in SEE

- ▶ TSOs and Regulators are investigating possibility to implement SEE TSOs proposal for transmission capacity allocation, based on better representation on physical behavior of interconnected electric systems than those widely used on most of the European borders until now (bilateral ATC allocation)
- ▶ SEE CAO Implementation Group worked on all necessary activities in order to create CAO involving all stakeholders (TSOs, regulators, traders, donors, ...)
- ▶ Dry-run phase since January 2004
- ▶ Based on: Border Capacity, PTDF matrix, traders' bids procedure
- ▶ Introduced Maximum Flows concept concerning interconnection capacity values with aim to make physical limitations more transparent – reporting “critical branches” approach; thermal limits as the only input
- ▶ Internet based tool: [www.drcat.at](http://www.drcat.at)
- ▶ SEE CAO structure will be owned by SEE TSOs
- ▶ Future prospects: SEE CAO establishment in 2012

## SEE Coordinated Auction Office

- ▶ **CEE** and **SEE** TSOs decided to **implement Explicit Flow-based CA mechanism** in SEE Region ... **vs.** CWE, SWE and Nordic Region where **Implicit NTC based mechanism** is implemented (Market Coupling, Market Splitting)
- ▶ Coordinated Auctions and **CAO** are in **compliance** with **Regulation 1228/03 (714/2009)** and **CMG** provisions
- ▶ **Majority** of EnC contracting parties **support** the establishment of a Coordinated Auction Office in the SEE region
- ▶ **Steering Committee** for creation the **Project Team** for CAO establishment - underway
- ▶ MC supported **Montenegro** as **location** for SEE CAO

## SEE Coordinated Auction Office

- ▶ **NTC based approach** for SEE CAO as the **first step**
- ▶ **ECS studies** related to SEE CAO (technical and legal study)
- ▶ **Project Team** will **produce** SEE CAO relevant **documents**: Business Plan, Auction Rules, NTC vs. Maximum Flow approach, etc.
- ▶ **SEE Regulators** will have to **approve** SEE CAO related **rules** and perform CA and SEE CAO **Monitoring**
- ▶ **ECRB** is working on **SEE CAO Monitoring** → proposal for approval of SEE CAO related documents and SEE CAO Monitoring (regional vs. national) – as part of USAID MM Project



## Activities on ex-ERGEG ERI reporting / ACER

- ▶ SEE Regulators recognized a **need** for a **detailed overview** of **current CB mechanisms in SEE** as there is a necessity to work on **improving** Cross-Border modalities in SEE
- ▶ Necessary to **investigate** how EnCT signatories are **taking** necessary **steps** in order to **meet CMG requirements** and analyze their awareness of the progress they have to make in order to fulfill them
- ▶ SEE Regulators **discussed** detected **deviations** from Regulation 1228/03 (714/2009) and CMG, including an explanation/motivation for these deviations and assessing which of them are within the regulatory scope and how and by when to **overcome** them
- ▶ **ECRB** agreed to **follow** the **transparency monitoring approach** applied by **ERI**
- ▶ Transparency Monitoring will be exercised by ECRB-Section
- ▶ Upon ex-ERGEG proposal, ECRB welcomed **inclusion** of the **8<sup>th</sup> Region progress report** as **Annex** to **ERI/ERGEG reporting**, but keeping content responsibility with ECRB
- ▶ ECRB EWG took part in ex-ERGEG ERI TF CB activity; now ACER ERI

# General Principles for Congestion Management

**Regulation (EC) 1228/2003, Article 6:**

*“...Network congestion problems shall be addressed with non discriminatory market based solutions which give efficient economic signals to the market participants and transmission system operators involved...”*

*“... The maximum capacity of the interconnections and/or the transmission networks affecting cross-border flows shall be made available to market participants, complying with safety standards of secure network operation ...”*

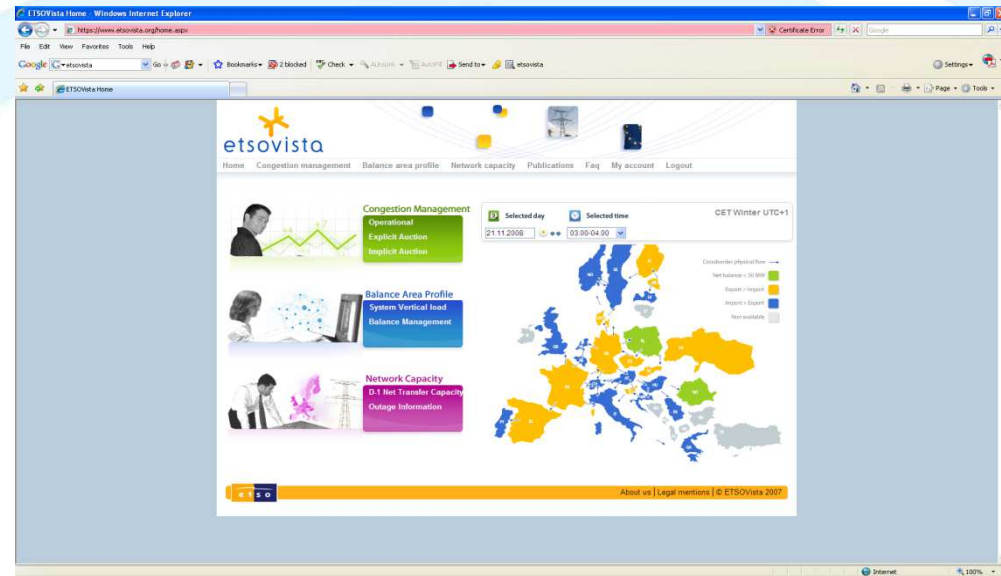
**No pro-rata allocation of capacity & No long term contracts**

## Progress

- ▶ Preliminary review regarding actual Cross-Border mechanisms in SEE Region was presented to the 12<sup>th</sup> **Athens Forum**
- ▶ The Contracting Parties made significant **progress** towards reaching **full compliance** with the **Regulation 1228/03 (714/2009)** within the last year
- ▶ Especially **Transparency** regarding the Allocation of Cross-Border Capacity was **increased** within the last year
- ▶ Most of the contracting parties **introduced** a **Market-based Capacity Allocation scheme** (50/50 split)
- ▶ Most of the contracting parties perform **no Common Auctions** (except MAC-GR, HR-HU, AL-GR, SRB-HU), but few SEE TSOs recently started **negotiations** (SRB-CRO, SRB-BUG, ...)

# Transparency

- **Increased Transparency** can be noticed in SEE region
- TSOs of the contracting parties take part in the **ENTSO-E Vista project** which foresees publication of Auction results, CB flows, available capacities, etc. (according to Regulation 1228/03 and CMG provisions)
- Furthermore, the EnC contracting parties increased the number of documents **available in English** in their web sites
- Market Rules will be published by all EnCT signatory parties soon (during 2011)
- **ENTSO-E Transparency Guidelines**





## Market Monitoring: General

- ▶ Market Monitoring activities are **necessary** for each **national** electricity market in order to provide its **well functioning** in line with approved rules and **based on non-discrimination and transparency**
- ▶ As the **regulators** are entities which **approve Market Rules** and give guidelines for Market Design, they should also **develop Market Monitoring tools** in order to **check** if these rules and recommendations are **fully respected** and **implemented**
- ▶ **Usually** the **TSO** or **Market Operator** is **proposing** the **market rules** or other rules related to organizing or enabling functioning of electricity markets
- ▶ Therefore, **regulators** have to **check** if the TSOs have **implemented** all agreed rules and if they **respect** and conduct their activities in line with them

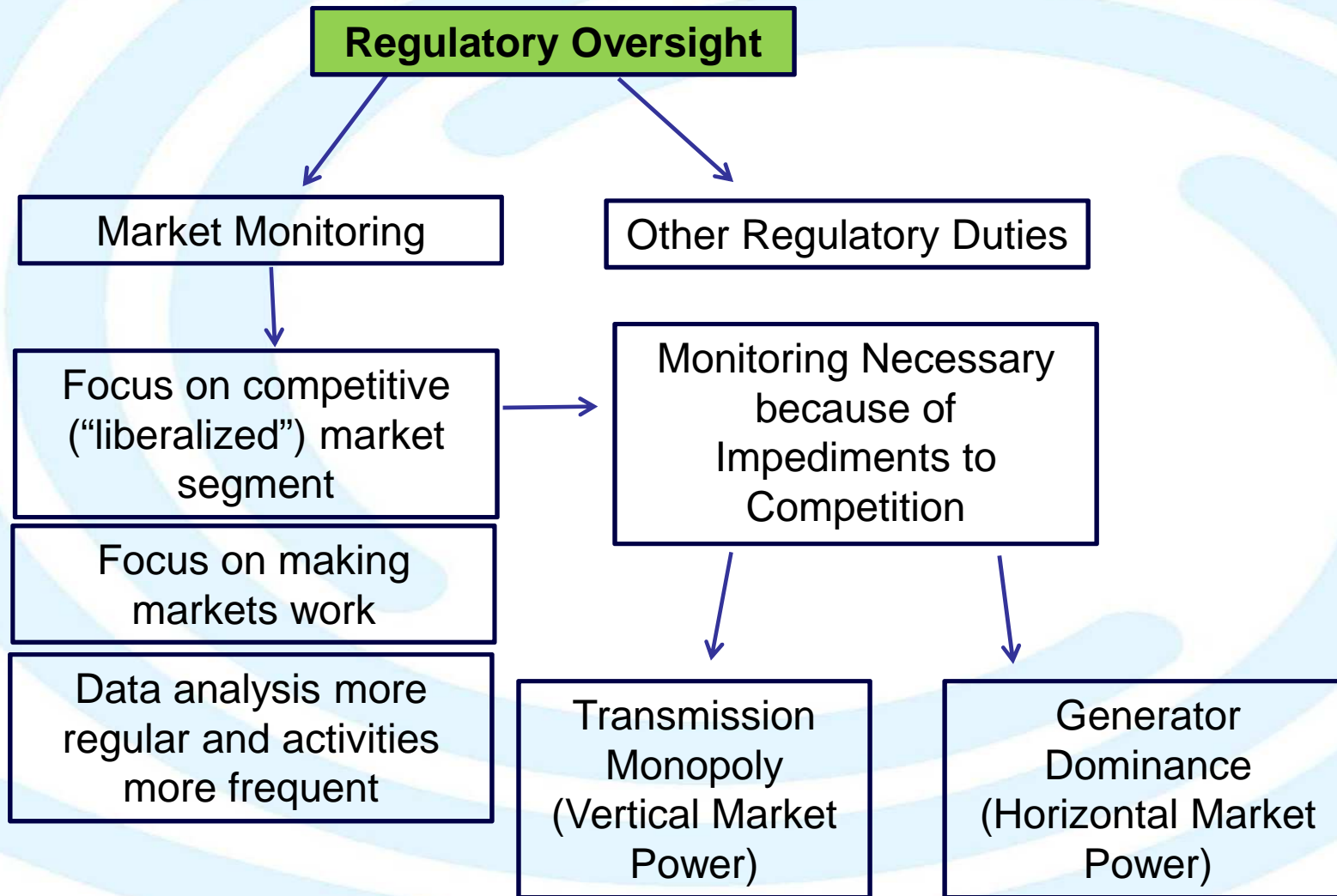
## Market Monitoring: Electricity Market in SEE

- ▶ SEE region (8<sup>th</sup> region) is characterized as a region with **partially opened** and **not sufficiently liquid** electricity markets, but with **very dynamic cross-border trade** transactions
- ▶ Due to low tariff prices of electricity in most of the SEE countries, big industrial consumers prefer **not to exercise** their **eligibility** and **remain tariff** consumers, and thus slow down opening of electricity markets
- ▶ Therefore, there is **no active and liquid** electricity market in SEE which could be fully monitored by regulators, using and implementing usual Market Monitoring schemes, indicators and approaches
- ▶ **Only** Cross-Border activities in SEE Region could be fully and broadly examined and monitored by regulators at the moment
- ▶ **SEE Regulators need to timely acknowledge** and **learn** how to monitor all performances within electricity markets in order to provide non-discriminative and transparent participation for all participants in the electricity markets

## Market Monitoring responsibilities in SEE

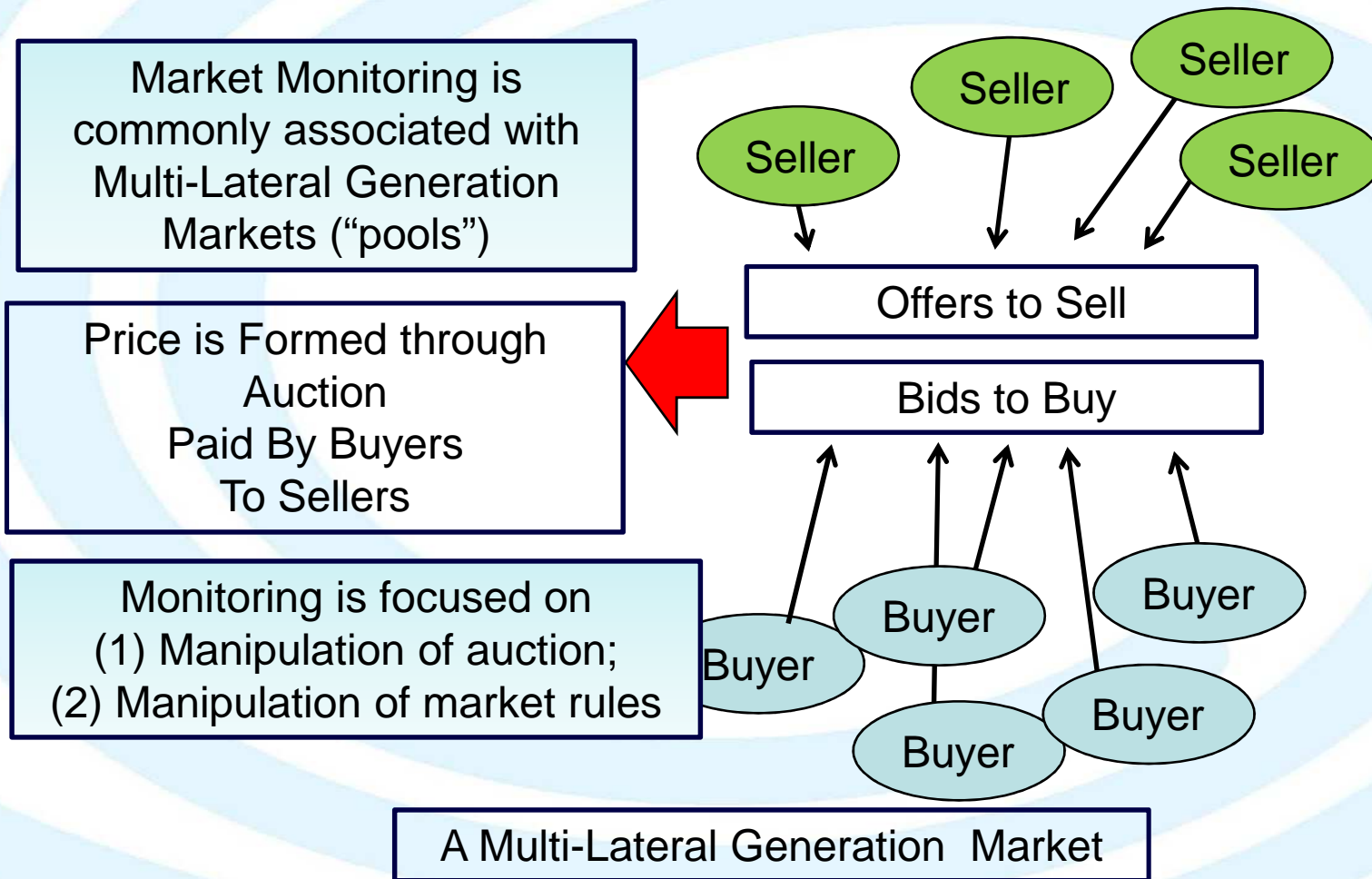
- ▶ NRAs in SEE are usually given **authority** to **track** licensed subjects' **behavior** in the electricity market and **produce reporting**, as the expert bodies for Electricity Market, **but...**
- ▶ NRAs are usually **not given** any **authority** to **penalize** those participants which did not obey to rules in SEE
- ▶ **EU MS NRAs** are **given authority** to **overtake concrete measures** against breaches in the market – **difference** between EU and SEE (CPs)
- ▶ The only measure that most of SEE NRAs could raise against those participants that breach rules is **withdrawal** of the **license** – but being the radical measure and not very popular...
- ▶ In SEE, the **Competition Authorities** are given authority to **performing concrete action** (penalties) against participants in cases they get input from NRAs on detected deviations
- ▶ Therefore, **strong cooperation** between **Regulatory** authority and **Competition** authority must be envisaged and developed

# Electricity Market Monitoring





# Market Monitoring Scheme for „Pools“

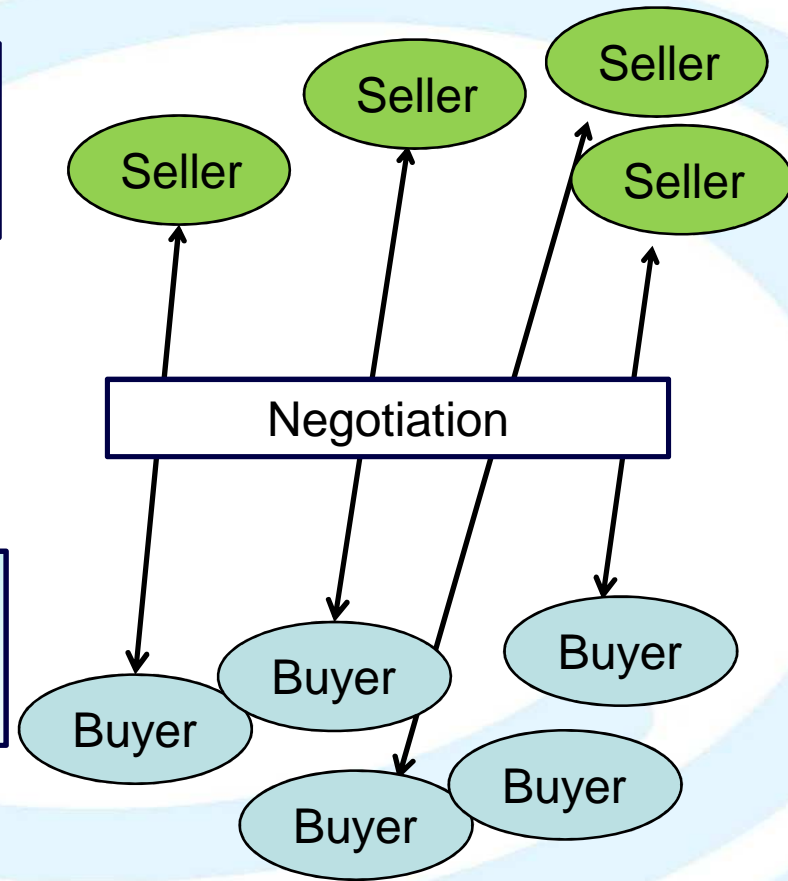


# Market Monitoring in Bilateral Markets (SEE)

Market Monitoring is also used in Bi-Lateral Generation Markets

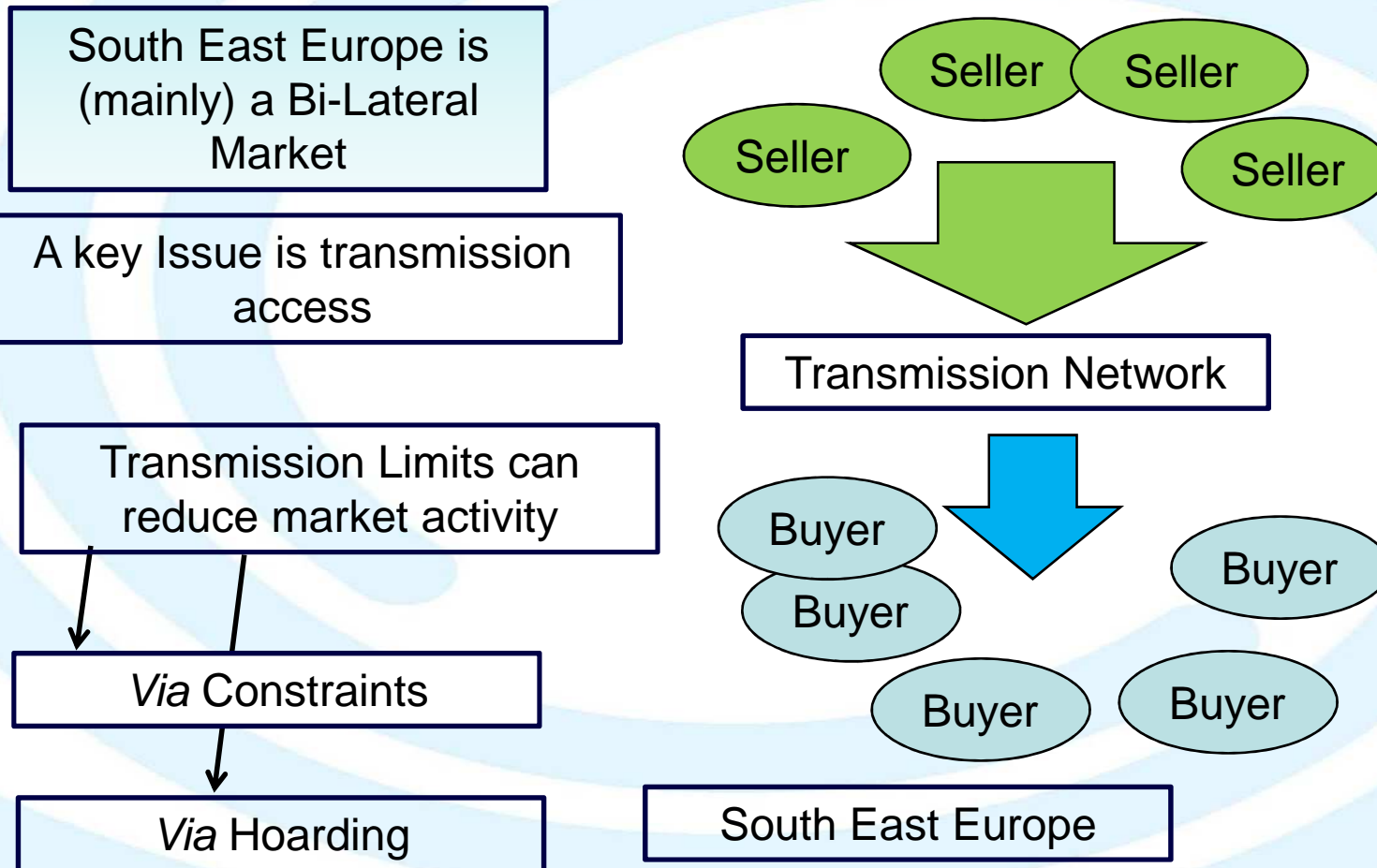
Price is Formed through direct negotiation, through "tenders"

Monitoring is focused  
(1) on transmission access;  
(2) Seller Dominance

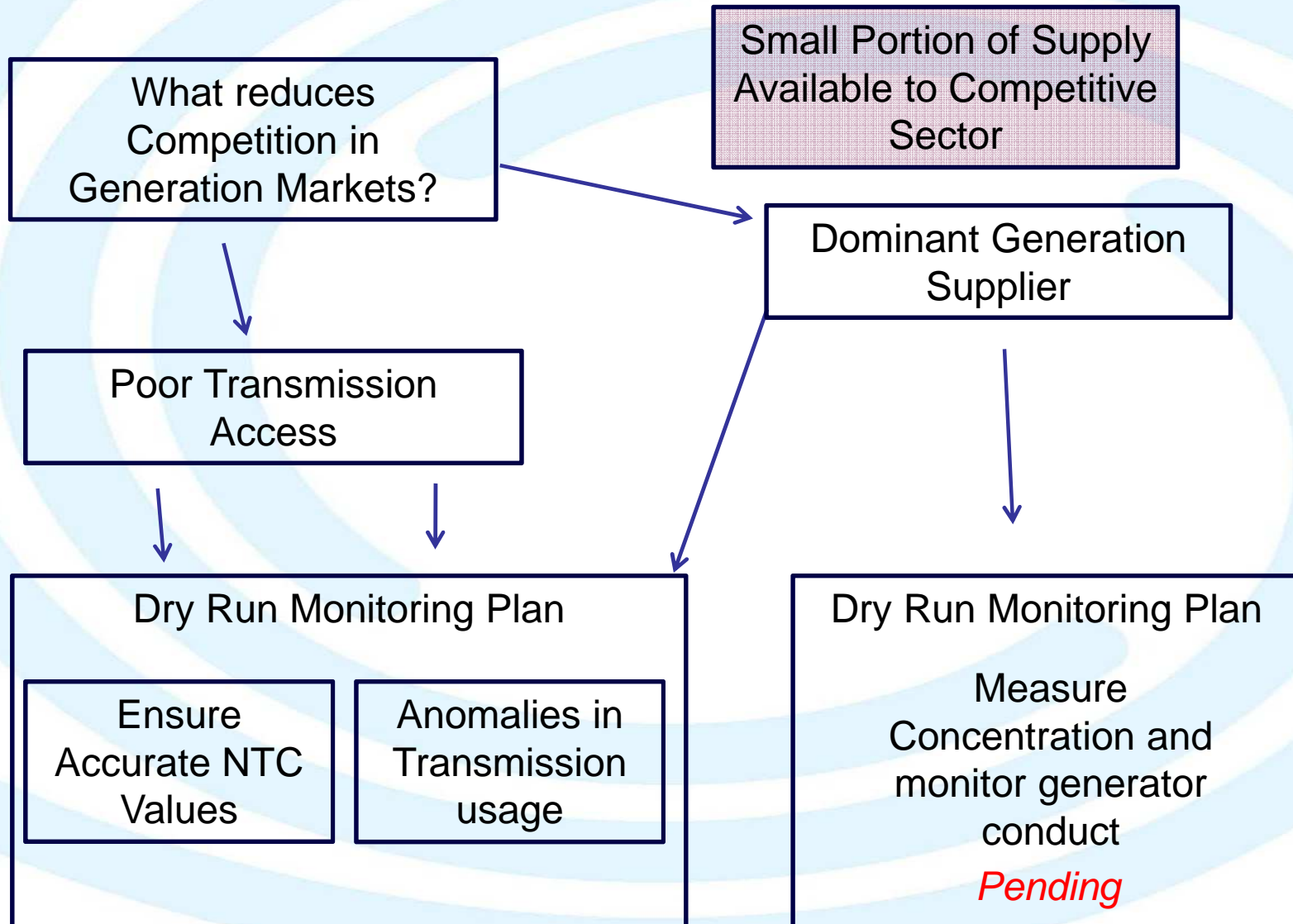


A Bi-Lateral Generation Market

# Market Monitoring in SEE Region

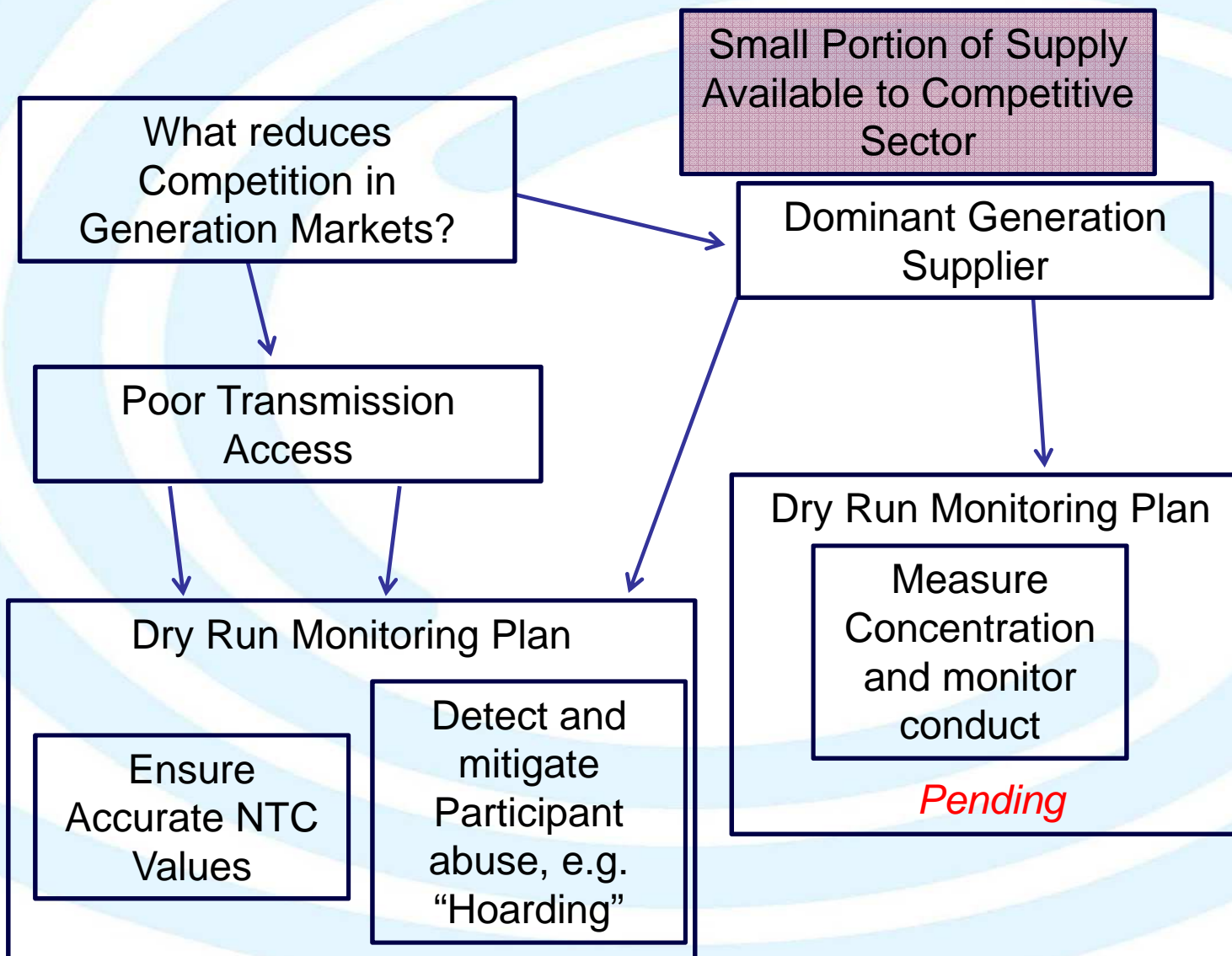


# Dry-Run Market Monitoring Project in SEE Region

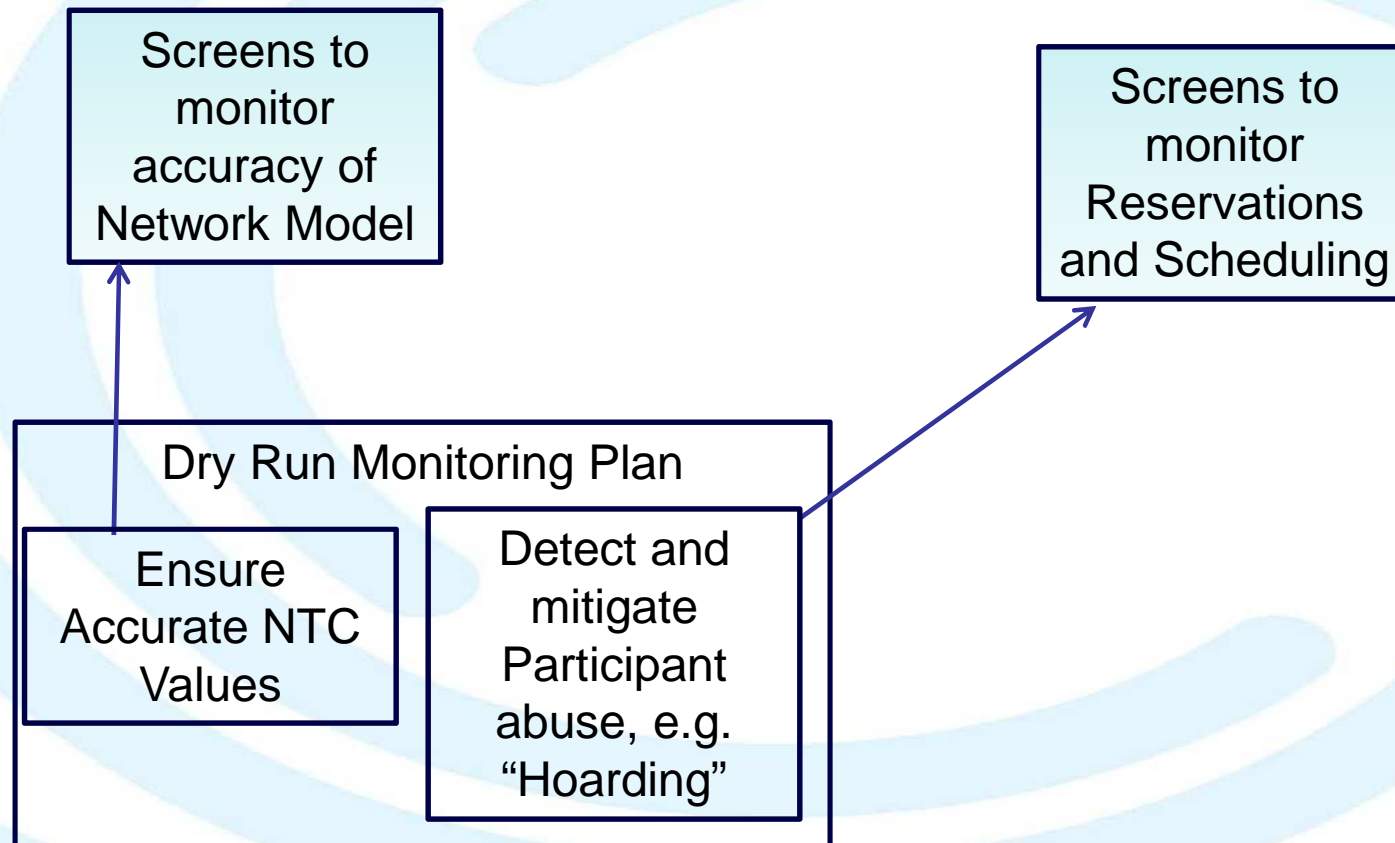




# Dry-Run Market Monitoring Project in SEE Region



# Market Monitoring in SEE Region



# USAID Market Monitoring Project in SEE Region: History

- ▶ **MM Project** was initiated after invitation from the 8<sup>th</sup> Athens Forum in **June 2006** to establish a **Market Monitoring Pilot Plan**, which became effective in December 2006
- ▶ 12<sup>th</sup> Athens Forum (May 2008), ECRB and ECRB EWG **recommended continuing** MM Plan under a two-year **transition phase** that would lead to sustainable operations within ECRB, including **extension** of MM project in 2 streams:
  - **SEE CAO Monitoring** modalities, and
  - **General MM - education of SEE regulators** on general MM activities
- ▶ **Primarily involves Cross-Border** transmission capacity market - **ensuring maximum capacity is available** on the interconnections and that this **capacity is allocated** and **used** in a **non-discriminatory manner**
- ▶ **MM Project** is designed with **goals**:
  - to **ensure accurate estimates of cross-border transfer capacity**
  - to **ensure proper utilization of reserved capacity** (i.e., no hoarding or over-scheduling)

## USAID Market Monitoring Project in SEE Region: History

- ▶ **Very first phase:** Cross-Border Monitoring – **USAID/PE produced Quarterly Reports** and various templates due to the importance of maximum and non-discriminatory access to interconnectors
- ▶ ECRB EWG **recommended changing** Quarterly Report format and **starting more operational phase: learning phase** for regulators and **direct cooperation** between **TSOs** and **regulators** on **data collection** and **analysis**
- ▶ **USAID/PE** presented its **proposal** for **MM indicators** within MM general work-stream:
  - **Seven monitoring Screens** to accomplish the objectives for **monitoring Cross-Border transmission capacity market**
  - Market Monitoring **proposal** was agreed and **supported** by ECRB **EWG**, based on PE Screens proposal
  - MM **Dry-Run** has **started successfully** with Screen 1 in **November 2009** as part of Transitional phase



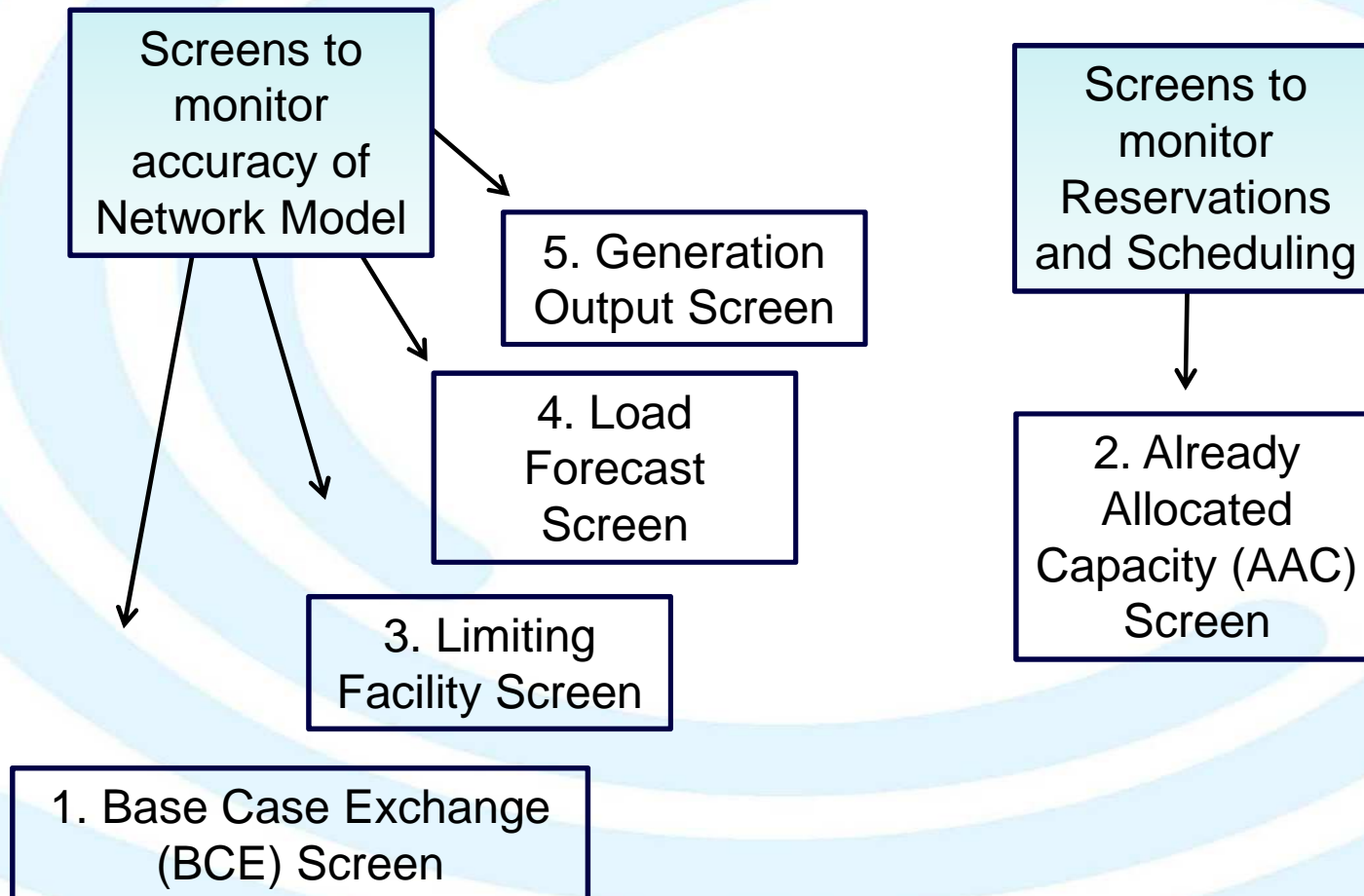
# USAID Market Monitoring Project in SEE region: History

- ▶ The **MM Project** includes the **entire 8<sup>th</sup> Congestion Management Region**
- ▶ Project introduces a **single Screen (1-7) each month** and asks **NRAs** to **request** from **TSOs** very specific **data** to **calculate very specific screens** in order to be able to **make conclusions** regarding Screen analysis outcomes
- ▶ **USAID MM Workshop** was organized on 18 May 2010 in ECS premises in Vienna with support of ECS
- ▶ **SEE regulators** (EWG) were **invited** to participate this Workshop in order to **discuss** MM Screens, make **analysis**, pose **questions** and **comments** and try to **define an appropriate MM procedure** in the 8<sup>th</sup> Region on **common template basis, respecting ERGEG monitoring experiences**
- ▶ **SEE TSOs** representatives were **also invited** to participate MM Workshop as they are important for MM cooperation between regulators and TSOs

## USAID Market Monitoring Project in SEE

- ▶ These Screens have **focused only** on **cross-border** transmission capacity as **first phase** of MM Dry-Run
- ▶ **Later** phases will **focus** on **other aspects of the market**, e.g. generation (as electricity market evolves, develop and mature)
- ▶ With respect to each individual Screen, **NRAs** and **TSOs** aimed to **determine** whether:
  - There is agreement on the technical correctness of the Screen?
  - There are clear benefits from Screen implementation?
  - Regulators should implement the Screen?
- ▶ After examining all four Screens for which Dry-Run experience was available, all NRAs and all TSOs attending **concluded** the **Screens** are **desirable** and **beneficial** for **removing obstacles** to market competition in the 8<sup>th</sup> region
- ▶ It was also concluded that EWG will propose to and seek ECRB approval in June 2010 to draft MM Guidelines for the 8<sup>th</sup> Region based on Screens accepted at the Workshop (This task would be undertaken by USAID/Potomac Economics)

# Dry Run Market Monitoring Project



## 8<sup>th</sup> Region Market Monitoring Guidelines

### Draft Market Monitoring Guidelines (Screens 1-4)

- It was concluded that, upon ECRB approval, **Market Monitoring Guidelines** would define the **minimum set of commonly introduced MM Screens** (for cross-border issues) for all NRAs of the 8<sup>th</sup> Congestion Management Region
  - ▶ At the May 2010 SEE Market Monitoring Workshop, NRAs and TSOs recommended adopting Dry-Run market Monitoring Screen 1-4 as the basis for the 8<sup>th</sup> Region Market Monitoring Guidelines;
  - ▶ ECRB approved drafting of the 8<sup>th</sup> Region Guidelines and PE submitted this Draft to EWG in 2010



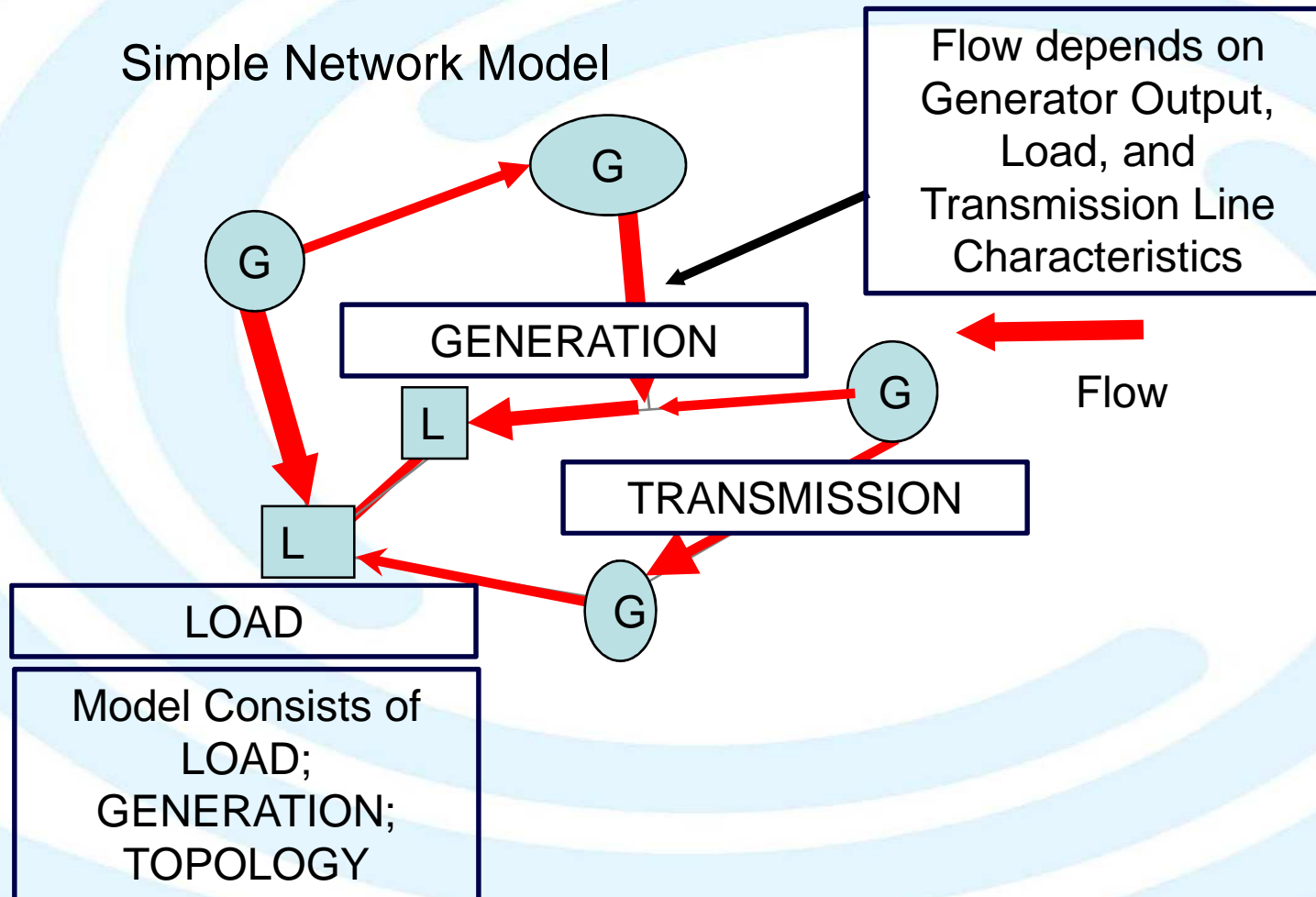
## Market Monitoring the Network Model

- ▶ **Network Model** is used to estimate cross-border capacity
- ▶ **Reasons** for the Initial Focus on Network Model
- ▶ A critical component of the Liberalized sector
  - ✓ Cross-Border Trade **essential** to market **development**
- ▶ **Screens** would **also fit Coordinated Auction Monitoring** program
- ▶ Simulation of the Electrical System including:
  - Transmission Elements;
  - Load;
  - Generation; and
  - Control Area Exchanges
- Network Model is **used** to **estimate NTC values**, which **indicate** the **capacity available** on the cross-border interconnections for exchanges

# The Network Model

Network Model

Simple Network Model



## SEE MM Dry Run Project: Status of Play

- ▶ ECRB EWG started the Dry Run project in September 2009
- ▶ The project introduces a single screen each month
- ▶ Five Screens have been introduced as of 1 May 2010
- ▶ More screens were introduced afterwards
- ▶ These screens have focused on cross-border transmission capacity
  - This comprises “Part I” of the Dry Run
  - Part II will focus on other aspects of the market, e.g., generation

## SEE MM Dry Run: Procedures

### Basic Approach of Dry Run:

- ▶ NRAs to collect national (control area) data from TSOs
- ▶ Calculate screens
- ▶ Conduct follow-up when screens indicate an anomaly that may adversely affect the market
- ▶ Screens are established in advance
- ▶ Follow-up depends on circumstances



## Regulation EC 1228/2003

**In addition to the NRAs' National focus, NRAs would “cooperate” by sharing the monitoring data:**

- ▶ This enables the **addressing of regional issues**
- ▶ This cooperation is envisioned in **Regulation EC 1228/03 (714/2009):**

*(Article 9): “Where appropriate to fulfill the aims of this Regulation [NRA’s] shall cooperate with each other and with the Commission.”*

## SEE MM Dry Run

- ▶ The **Dry Run** is **developing** the **capacity** for **NRAs** to **perform** their **own National monitoring**
- ▶ Furthermore, as explained previously, there is a **need** for **regional analysis**
- ▶ Who is going to analyze the data on a regional level to help NRAs and ECRB EWG to “cooperate”?
- ▶ We do not believe it requires new authority for existing entities or a new supra-regional entity
- ▶ There are two options that appear to be practical

## SEE MM Dry Run Results: Participation

- ▶ **All 8<sup>th</sup> Region Countries have participated** - Except Bulgaria, Hungary have not provided data for any period of Dry Run
  - Montenegro regulator is attempting to gain TSO participation
  - The participation has been regular and thorough
- For Screen 5, most NRAs have been successful at obtaining data on generator output; Aside from Bulgaria, Hungary, and Montenegro, only Croatia continues to face obstacles in securing this data;
- Due to the need for a time series of data, missing data causes problems
  - ▶ Missing data has caused many instances where the screens cannot be evaluated;
    - ◆ Part of this is related to the fact that consecutive months of screen data is necessary to complete the monitoring
    - ◆ In particular, a screen violation occurs when an individual month's screen exceeds the threshold and it was exceeded in two of the previous three months;
    - ◆ This requires four consecutive month's of data;

## Market Monitoring Guidelines Goal

- ▶ Present Each Dry Run Screen:
  - ◆ Theory
  - ◆ Measurement
  - ◆ Results
  - ◆ Go forward with Screen?
- ▶ Round Table on Experience – Workshop on MM
- ▶ Regional vs. National Monitoring / Coordinated Auction
- ▶ Next Steps



# 8<sup>th</sup> Region Market Monitoring Guidelines: Status of Market Monitoring Screens

All screens in the Guidelines are concerned with cross-border activity;

▶ **Screen 1:** Base Case Exchange (BCE) Screen. Monitors the accuracy of cross-border transactions forecasts in Network Model;

❖ Network Model is used to establish cross-border Net Transfer Capacity (NTC)

▶ **Screen 2:** Already Recommended: Monitors the usages of cross-border reserves by EWG to ECRB for hoarding (Hoarding);

▶ **Screen 3:** Critical: Monitors the accuracy of Network Model outputs for cross-border limiting facilities;

▶ **Screen 4:** Load Forecast: Monitors the accuracy of load forecasts in Network Model;

▶ **Screen 5:** Generation Output Screen – monitors the accuracy of generation forecasts in Network Model;

▶ **Screen 6:** TRM: Monitors imbalances for TRM accuracy and control area exchanges;

▶ **Screen 7:** Control Area Exchanges: Monitors imbalances for TRM accuracy and control area exchanges;

Already Recommended  
8<sup>th</sup> Region MM  
Guidelines

Awaiting EWG action;  
Most NRAs currently  
able to provide data.

Propose to combine into a  
single Screen 6 to address  
TRM.

# Market Monitoring Guidelines: document

## Table of Contents

1. INTRODUCTION
2. GENERAL PRINCIPLES
3. REGIONAL MARKET MONITORING
- 4.- 9. SCREEN 1 – SCREEN 6
10. AUCTION DATA SCREENING
11. DATA COLLECTION AND REPORTING
- ANNEX 1 - DEFINITIONS
- ANNEX 2 - TEMPLATES
- ANNEX 3 - TECHNICAL ANNEX
- ANNEX 4 – EXAMPLES OF REGIONAL COORDINATION

# Screen 1: Comparison of Base Case Exchange Assumptions to Cross-Border Schedules

- ▶ Introduction: The Role of BCE in Calculating ATC
- ▶ Data Requirements
- ▶ Calculation of Screen
- ▶ Screen Threshold and Interpretation of Results
- ▶ Explanations based on: ENTSO-E, “Procedures for Cross-Border Transmission Capacity Assessments” (October 2001)

## **Screen 1: Base Case Exchange (BCE) Screen**

- o This Screen is intended to **monitor accuracy of the assumptions of Network Model used to calculate net transfer Capacity (NTC)**
- o NRAs and TSOs **accepted** this Screen
- o TSOs should **cooperate strongly among themselves to harmonize process of establishing BCE values**
- o **Dry-Run Reports** should **report BCE values** (for each NRA), thus **facilitating comparison of BCE values** used by different TSOs

## Screen 2: Comparing Cross-Border Reservations to Cross-Border Schedules

- ▶ Introduction: The Logic of Comparing Schedules and Reservations
- ▶ Data Requirements
- ▶ Calculation of Screen
- ▶ Screen Threshold and Interpretation of Results

### Already Allocated Capacity (AAC) Screen

- o This Screen is intended to **monitor usage of cross-border transmission reservations**
- o **NRAs and TSOs accepted** this Screen
- o This Screen should be **enlarged to show the reservation and scheduling data** on the basis of individual participants



## Screen 3: Monitoring Base Case Simulations

- ▶ The logic of Monitoring Network Model Base Case Simulations
- ▶ Data Requirements
- ▶ Calculation of Screen
- ▶ Screen Threshold and Interpretation of Results

### Screen 3: Critical Facilities Screen

- o This Screen is intended to **monitor accuracy of the output of the Network Model used to calculate NTC**
- o NRAs and TSOs **accepted** this Screen
- o **Follow-up measures** specified for this Screen **need to be clarified**

## Screen 4: Monitoring Load Forecasts in the Network Model

- ▶ The logic of Monitoring Network Model Load Forecasts
- ▶ Data Requirements
- ▶ Calculation of Screen
- ▶ Screen Threshold and Interpretation of Results

### Screen 4: Load Forecast Screen

- o This Screen is intended to **monitor accuracy of the inputs to Network Model used to calculate NTC**
- o NRAs and TSOs **accepted** this Screen

## Screen 5: Monitoring Generator Output in the Network Model

- ▶ The logic of Monitoring Network Model Generator Output
- ▶ Data Requirements
- ▶ Calculation of Screen
- ▶ Screen Threshold and Interpretation of Results
- ▶ Screen 5 focuses to **monitor generator output forecasts in the *Network Model***

## Screen 6: Transmission Reliability Margin

- ▶ **Screen 6 - Transmission Reliability Margin: Monitors the calculation of TRM**
- ▶ Seeks to identify process of setting TRM and establishing monitoring metric
- ▶ We are still collecting information on the precise procedures used by TSO to calculate TRM
- ▶ Screen **may be different** for **each TSO**
- ▶ Recommend continuing development
- ▶ We have data to observe 5 control Area/data providers
- ▶ Screen 6 is still under development pending further consideration of specific methods used by TSOs to calculate TRM – however there is the final proposal
- ▶ We anticipate broader results over time as data is collected to complete the four-month time frame for more participants



## Screen 7: Control Area Balance Screen

- ▶ **Screen 7 - Control Area Balance Screen: Monitors the control area balance to detect sustained departures from schedules**
- ▶ Similar to previous Screens: Screen seeks to **compare forecast load and resource balance to actual load and resource balance**
- ▶ Rationale: Schedules and generation should match load, otherwise unofficial use of assets may be occurring
- ▶ **Recommend adding to 8<sup>th</sup> Region Guidelines**

## Auction Screening Data

- ▶ DataRequest
- ▶ In Yearly, Monthly, Weekly, and Intraday Auctions
  - ◆ Offered Capacity in Auction
  - ◆ Allocated Capacity to each Participant
  - ◆ Marginal Price
  - ◆ Capacity Resold and repurchased by each participant
- Curtailment Data
- ▶ Screens
  - ◆ Market Share
  - ◆ Herfindahl-Hirschmann Index – HHI: capacity portion concentration measurement
- ▶ Thresholds
  - ✓ 20% Market Share
  - ✓ 2500 HHI

## Further activities

- **Improve Format** of data collection (Potomac Economics)
- **Provide review of reports by NRAs for data errors** - change the reporting process to ensure reports are reviewed by NRAs for data errors - any error on input TSOs data validity could be detected after outcomes' analysis/reports and it should be reported ASAP by all: TSOs, NRAs and the consultant/PE
- Include **Standard Deviation with Mean Forecast Error**
- Need to address **NRA staff resources**
- NRAs to consider adding MM Guidelines to Grid Codes – **Information Code**
- According to details on **Regional MM** mechanism/procedures in order enable NRAs to **define appropriate entity** for this task on regional level; proposal to be checked with ECS where involvement by ECS would be foreseen
- **Coordinated Auction**
  - Dry Run Screens could be used in future CA,
  - Especially with respect to NTC model, but also flow-based model

## Web-Based Data and Reporting Interface

- ▶ A key element of the implementation of the 8<sup>th</sup> Region Market Monitoring Guidelines is the Web-Based data collection and reporting data base system/Interface;
- ▶ South East Europe Automated Market Monitoring System (SEEAMMS) - SEEAMMS.COM
- ▶ This interface is intended to:
  - Simplify and Standardize data collection - Allow Direct Upload of Data
  - Check errors, organize data, regulate access
  - Automate screen and threshold calculations;
  - Report screen results;
  - Report screen violations;
  - Provide Regulator access to the data base
- ▶ Potomac Economics/USAID/IRG are continuing to work on development of the scope and structure of the tool
- ▶ PE has initiated contact with SEE TSO to assist in identifying standard data structures



# Market Monitoring

## Web-based Interface SEE

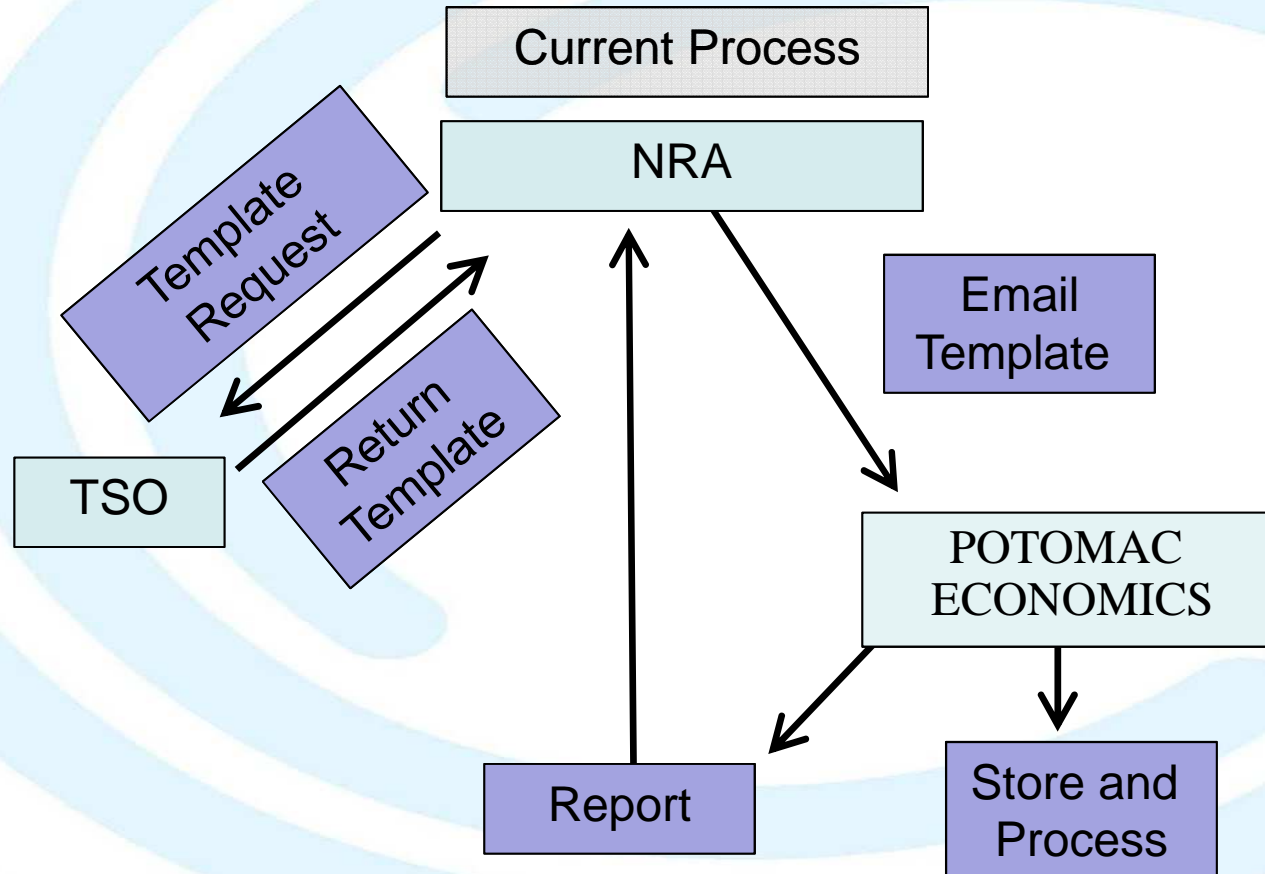
### Defined Tasks:

1. Develop web-based interface for data entry collection
2. Automate the storage and processing of data;
3. Automate reporting of charts and tables;
4. Validate data
5. Send automated alerts for screen violations;
6. Minimize resources required for maintaining system

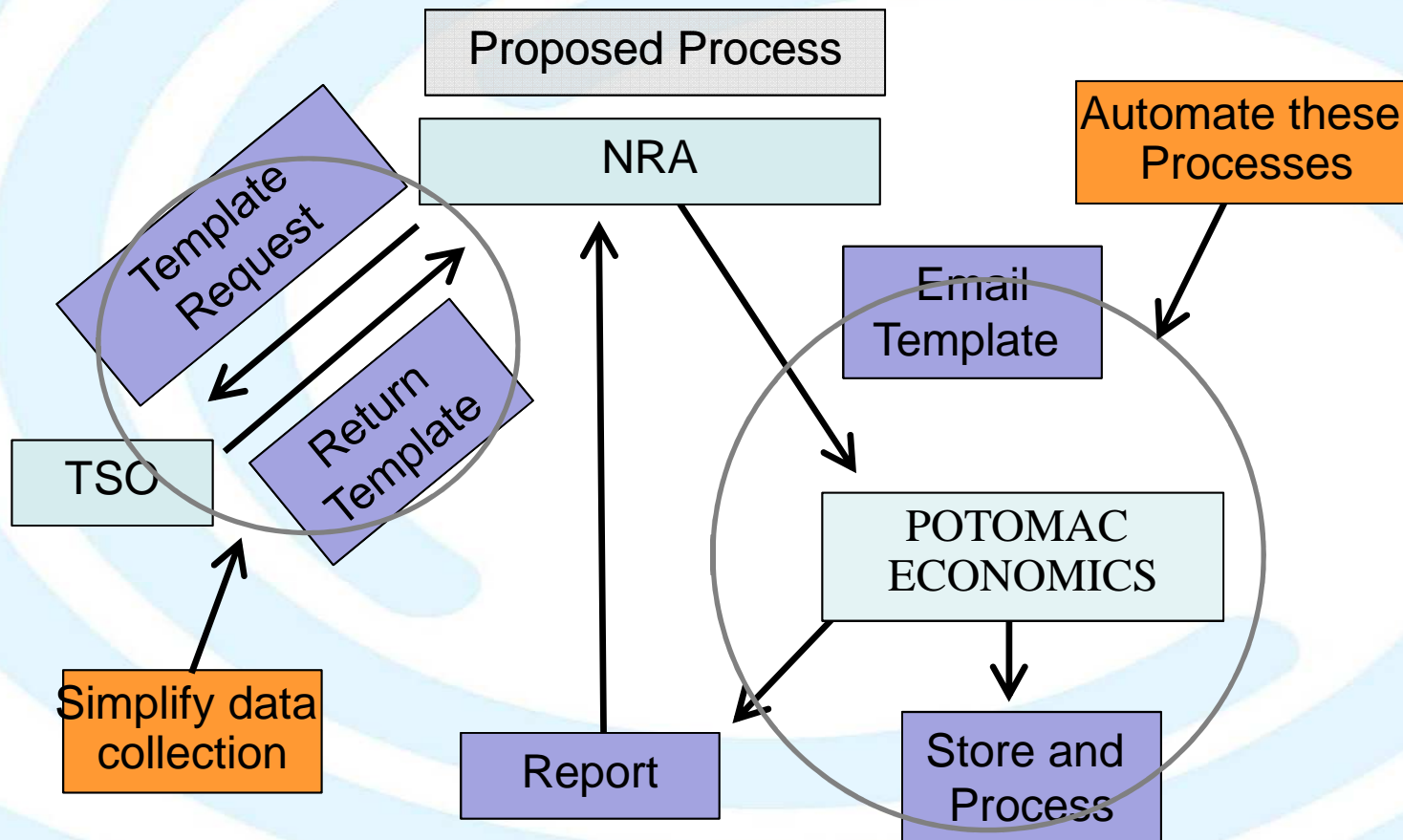
## Interaction with Other Data Bases

- ▶ No duplication on collection same data from TSOs (transparency and regulatory purposes)
- ▶ Our preliminary investigation into linkages to other regional data bases indicated that no standard data collection is present in the SEE region
- ▶ Data to ENTSO-E, for example, is sent manually
- ▶ EU is not having standardized MM structure, nor regional MM platform
- ▶ SEEAMMS is likely to be the leading data collection interface in the region
- ▶ Work on SEEAMMS can lend support to other processes, e.g., Entso.net (formerly ETSO-vista)

# Market Monitoring Interface South East Europe

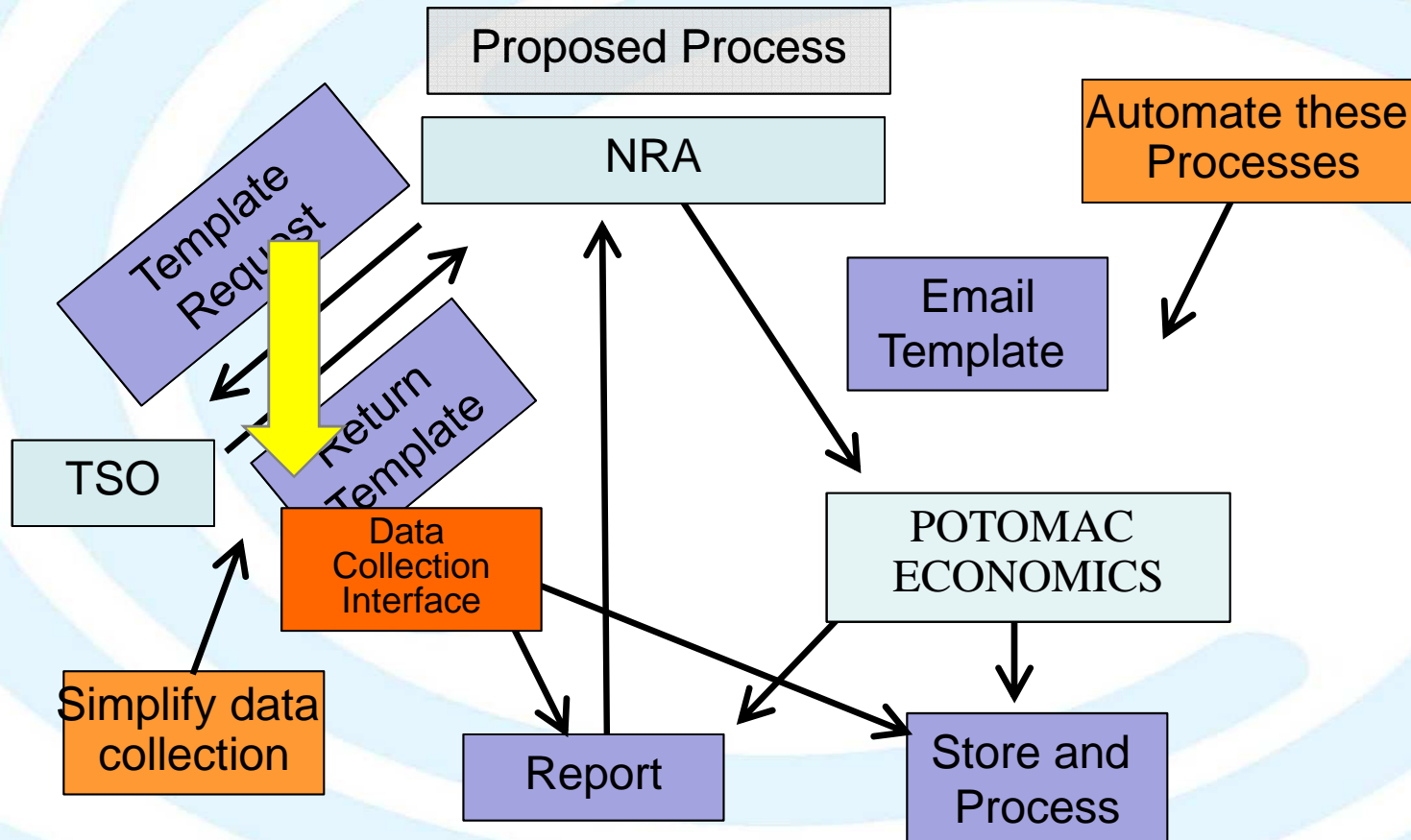


# Market Monitoring Interface South East Europe

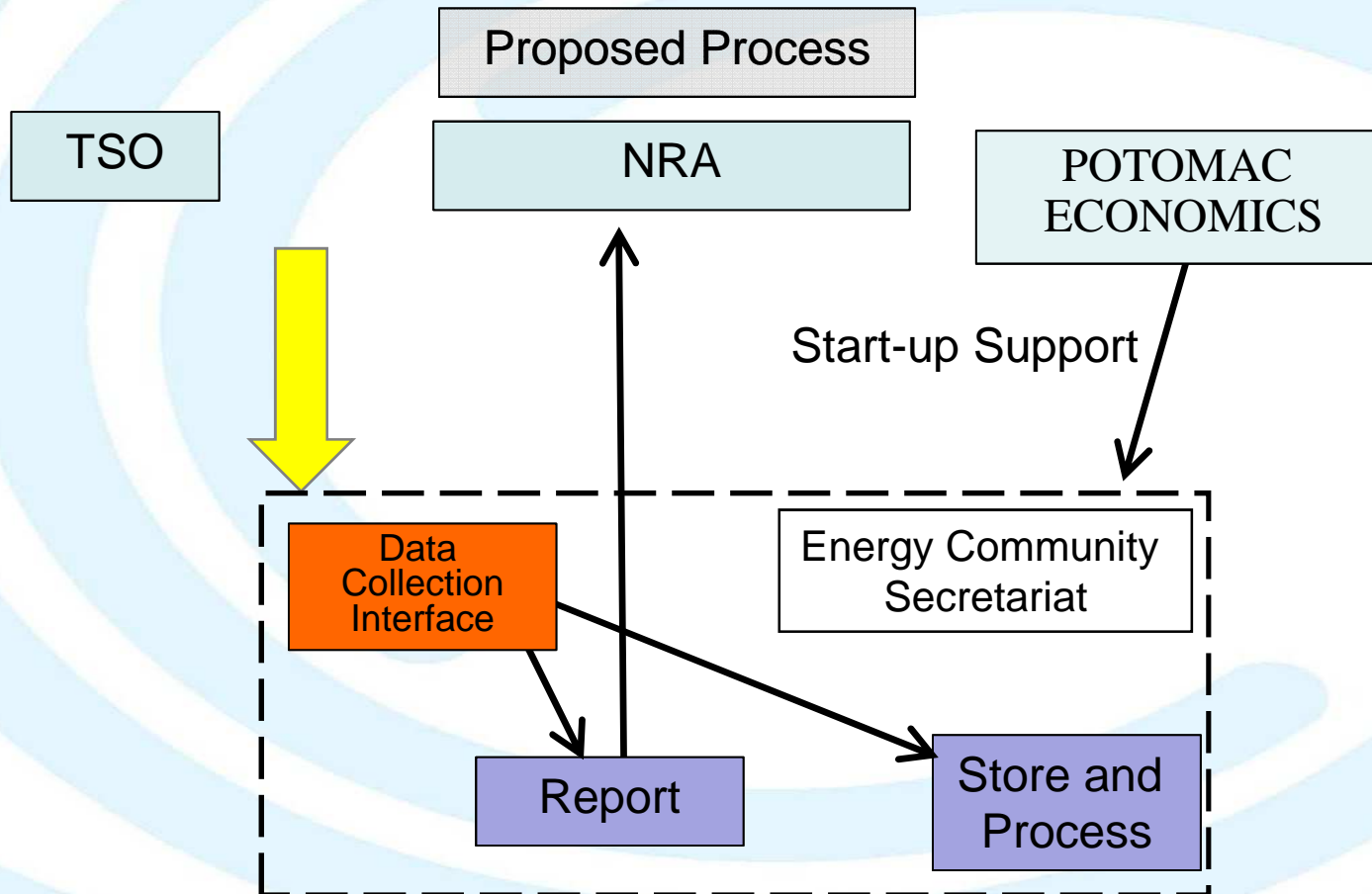




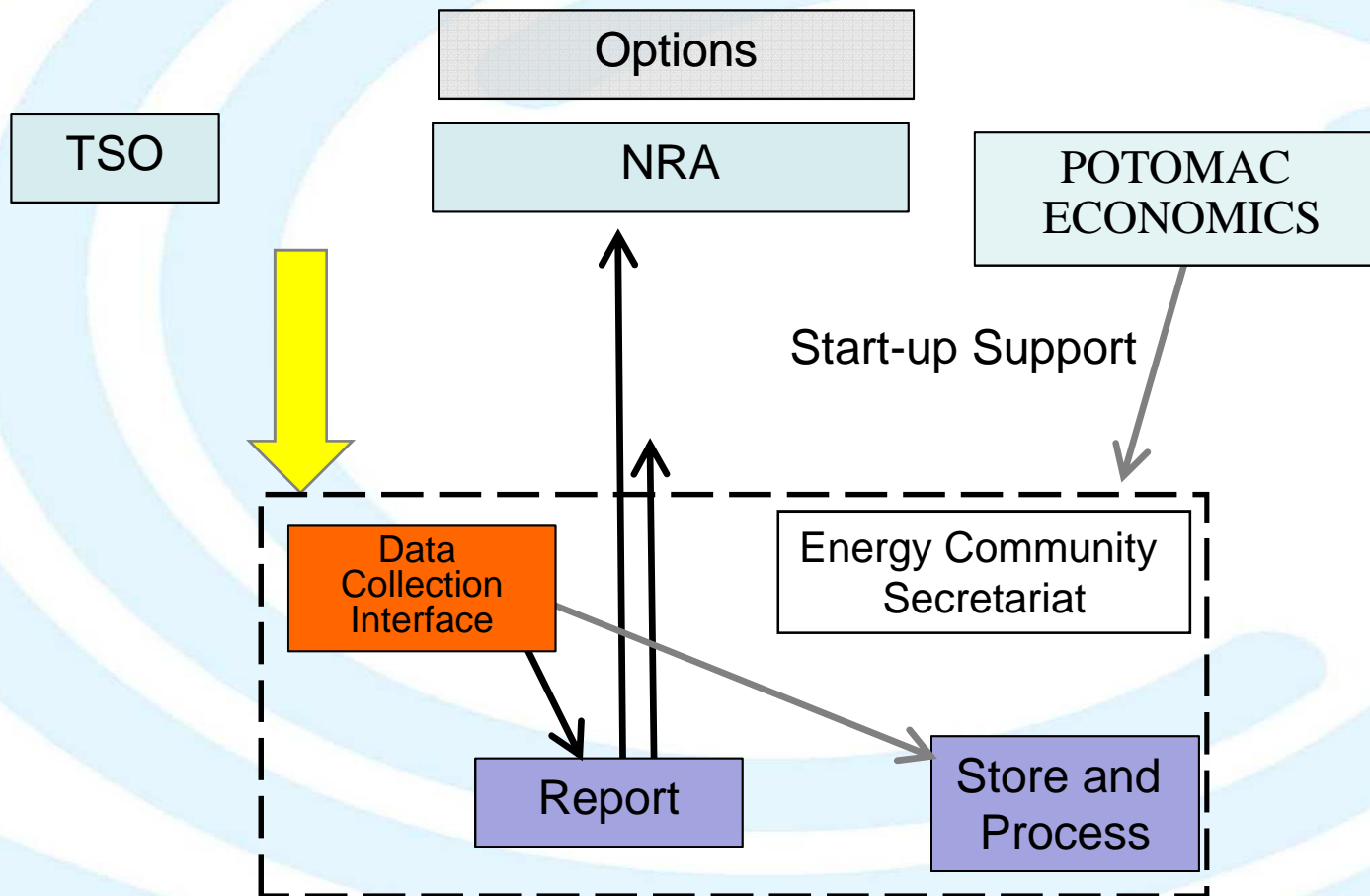
# Market Monitoring Interface South East Europe



# Market Monitoring Interface South East Europe



# Market Monitoring Interface South East European (MMISEE)



## Recommended First Steps

- Integration of data templates to a single template to simplify data collection (avoids duplication)
- Continue to develop chosen alternative to data base construction
- Begin reporting protocol manually
  - ◆ This means Potomac Economics will send reports that are expected to be sent by data interface.
- Coordinate with ECRB EWG TF1

### Next Steps:

- ▶ Finalize SEEAMMS software and conduct workshop in Fall 2011 and initiate Dry Run
- ▶ Implement SEEAMMS (December 2011)
- ▶ Future Work: Add monitoring of wholesale markets, Poyry, BETSEE; SEE CAO



## Other Regional Initiatives

- ▶ Other Regional Initiatives
  - SEE CAO IG and ECRB on SEE CAO Monitoring, performed by ECRB EWG TF1
  - Electricity Regional Initiative (ex-ERGEG ERI)
- ▶ Data elements proposed by the other projects will be useful for SEE Market Monitoring
- ▶ Substantial **overlap** of the data
- ▶ Non-overlapping data elements do indeed have value in general monitoring of SEE market activities
  - Dry Run project seeks to identify specific conduct, as opposed to more general metrics
- ▶ Some of the data must be combined with generator output, which may not be adequately available until 2012

## Other Regional Initiative Data Elements

### Curtailments

- ▶ Hourly Transmission curtailments
- ▶ Applicability to Market Monitoring: Curtailments can be useful to detect vertical market power – i.e., the transmission provider favoring its own generators in the open market by curtailing rivals
- ▶ Need generator ownership data

### Balancing

- ▶ Hourly procurement of system-wide balancing energy
- ▶ Applicability to Market Monitoring: This data is on an aggregate control area basis - good for general overall market trends
- ▶ A Screen requires further development
- ▶ No balancing market

## Other Regional Initiative Data Elements

### Market Share of Interconnection Capacity

- ▶ Annual, monthly, daily, and intraday day shares by participant of cross-border transmission capacity
- ▶ Applicability to Market Monitoring: The market shares of cross-border capacity could be analyzed in a screen once generator market shares are available

# Regional Market Monitoring

- ▶ There are **three elements** to Regional Market Monitoring:
  1. **Coordination among regulators to establish a consistent set of market monitoring Screens**
    - GGP have been initiated
  2. **Exchange of data among regulators to enable calculation of Screens and sharing of Screen results**
    - SEEAMMS allows collection and sharing of data
  3. **Coordination among regulators to share Screen results and to coordinate response to Screen violations**
    - Instances can arise where a sustain screen violation will be addressed by coordination with neighbouring NRA;
    - Example, in Screen 1, Guidelines suggest:  
“Temporarily using the BCE values provided by a neighbouring TSO that has superior forecasts”



## Regional Monitoring

- **Regional Monitoring** can be **beneficial** and can be conducted through “**cooperation**” among **NRAs**:
  - In a transition to a sustainable function in the region, **NRAs can conduct** national/control area MM through **issuing standardized common minimum set of Screens**
  - **Regional MM requires an entity to facilitate** “cooperation” among NRAs
  - **NRAs** should have an **explicit role in detecting anomalies or deviations** to Market according to MM reporting, and **react accordingly** (reporting to Competition Authorities or reacting by themselves in line with their authority)
  - ✓ SEE regulators (EWG) shall decide on the structure of a Regional MM when Consultant offers additional details on proposals

# Regional Market Monitoring Process

## Regional Market Monitoring

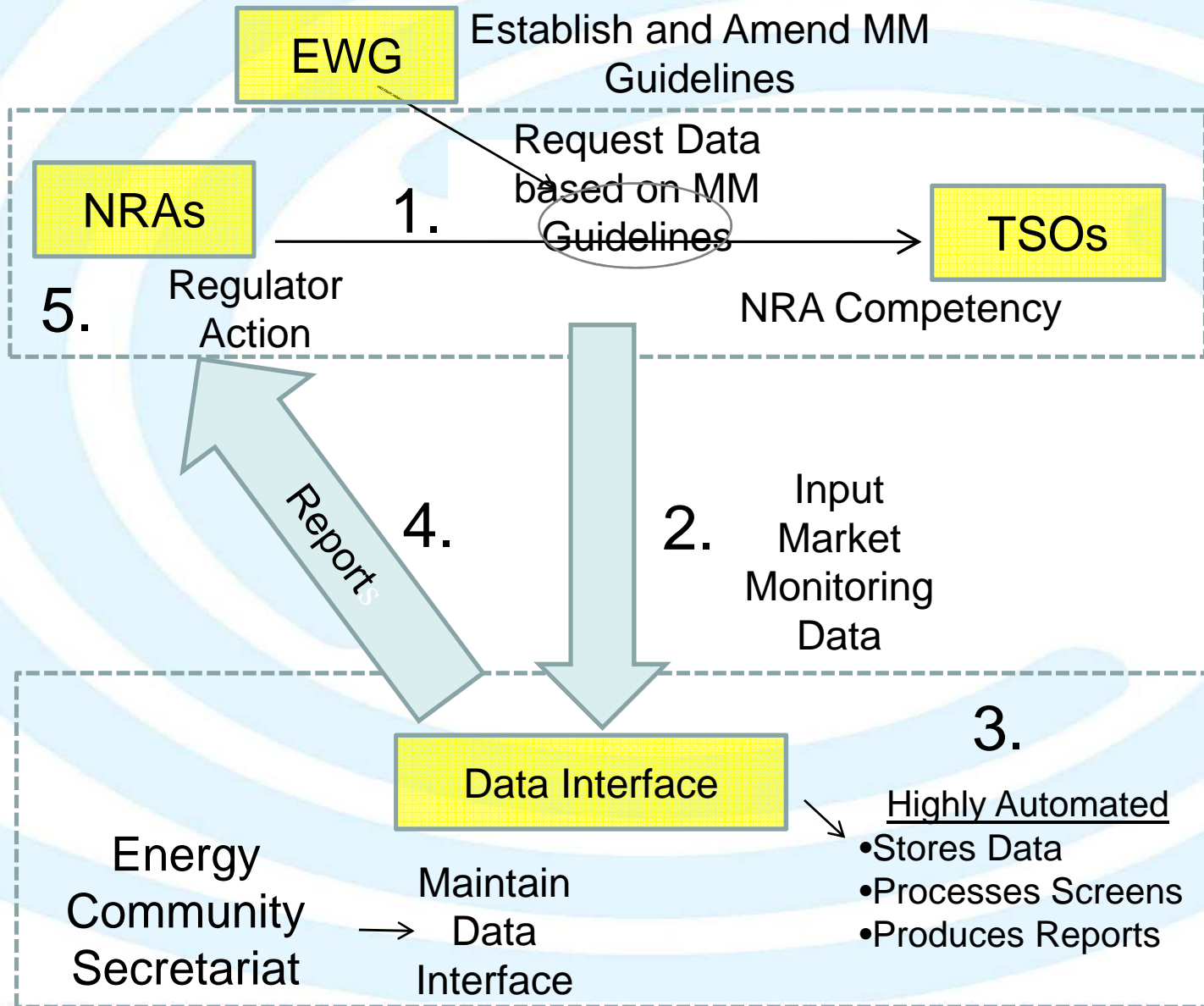
- ▶ Markets extended beyond a single regulatory authority, **requiring coordination among regulators** conduct market monitoring
- ▶ Regional Market Monitoring is the **collection and screening of data** so that **regulators can detect regional market failures or abuse** and **respond in a coordinated manner**
- ▶ To **conduct** Market Monitoring in the 8<sup>th</sup> Region, 8<sup>th</sup> Region **regulators must collect and analyze data on a consistent basis** and **respond in a coordinated fashion to instances of market failures and abuse**

# Regional Market Monitoring Structure

## Regional Cooperation

- ▶ Regulators establish a **consistent set of market monitoring Screens** so that **all regulators are working with the same data and market issues**
- ▶ ECRB EWG, in cooperation with USAID/PE, has **already facilitated the cooperation** among 8<sup>th</sup> Region regulators in **developing the 8<sup>th</sup> Region Market Monitoring Guidelines** (“Market Monitoring Guidelines”)
- ▶ The second level of cooperation is the **sharing of data and analyses produced in accordance with the Market Monitoring Guidelines**: This cooperation is facilitated by regulators collecting data and **submitting the data to a central entity for processing and reporting**
- ▶ **Coordination is required for regional monitoring** when a **Market Monitoring Screen may be violated**: Under such conditions, there may a **need for a coordinated response by two or more regulators**

# Regional Market Monitoring Structure





## Regional Market Monitoring Structure

- ▶ The **Dry Run** is developing the capacity for NRAs to do their own National monitoring, **but...**
- ▶ Furthermore, there is a **need for regional analysis**
- ▶ **Determine a structure** within which ECS or ECRB facilitates cooperation among NRAs and EWG for monitoring and **contributes regional analysis for periodic reports**
- ▶ **Who** is going to analyze the data on a regional level to help NRAs and EWG to “cooperate”...
- ▶ **We do not believe it require establishing new authority** for existing entities or a new supra-regional entity
- ▶ There are **two options** that appear to be **practical**:

# Regional MM: Proposals

## ECRB-Section Support to ECRB

### The Consultant's Recommended approach

- ◆ EWG proposes a Market Monitoring Work Plan for the approval by ECRB (8<sup>th</sup> Region Market Monitoring Guidelines)
- ◆ NRAs will issue Screens and conduct follow-up with market participants based on pre-defined screening thresholds
- ◆ ECRB-S coordinates the collection of data and analysis and summary of Screens and advises NRAs
- ◆ ECRB-S will prepare an ECRB Market Monitoring Report for the ECRB based on the analysis of Screens (with USAID transition support through Potomac Economics)
- ◆ The EWG/NRAs will advise and review the ECRB-S report before sending to ECRB for final approval
- ◆ The reports will be produced in time for review and approval at each ECRB meeting (approx. quarterly)

## Regional MM: Proposals

### **Alternative Option: ECS prepares Regional Report**

This is an alternative to the preferred ECRB-S approach

- ◆ NRAs will issue data requests and conduct follow-up with market participants based on pre-defined screening thresholds
- ◆ NRAs will submit data to ECS
- ◆ ECS will conduct MM analysis based on data provided by NRAs
- ◆ ECS will prepare a Market Monitoring Report based on the screens and analysis
- ◆ The EWG/NRAs will offer comments, but the ECS has full discretion in the Report's content
- ◆ EWG/NRA comments not accepted will be placed in an appendix
- ◆ The reports will be quarterly

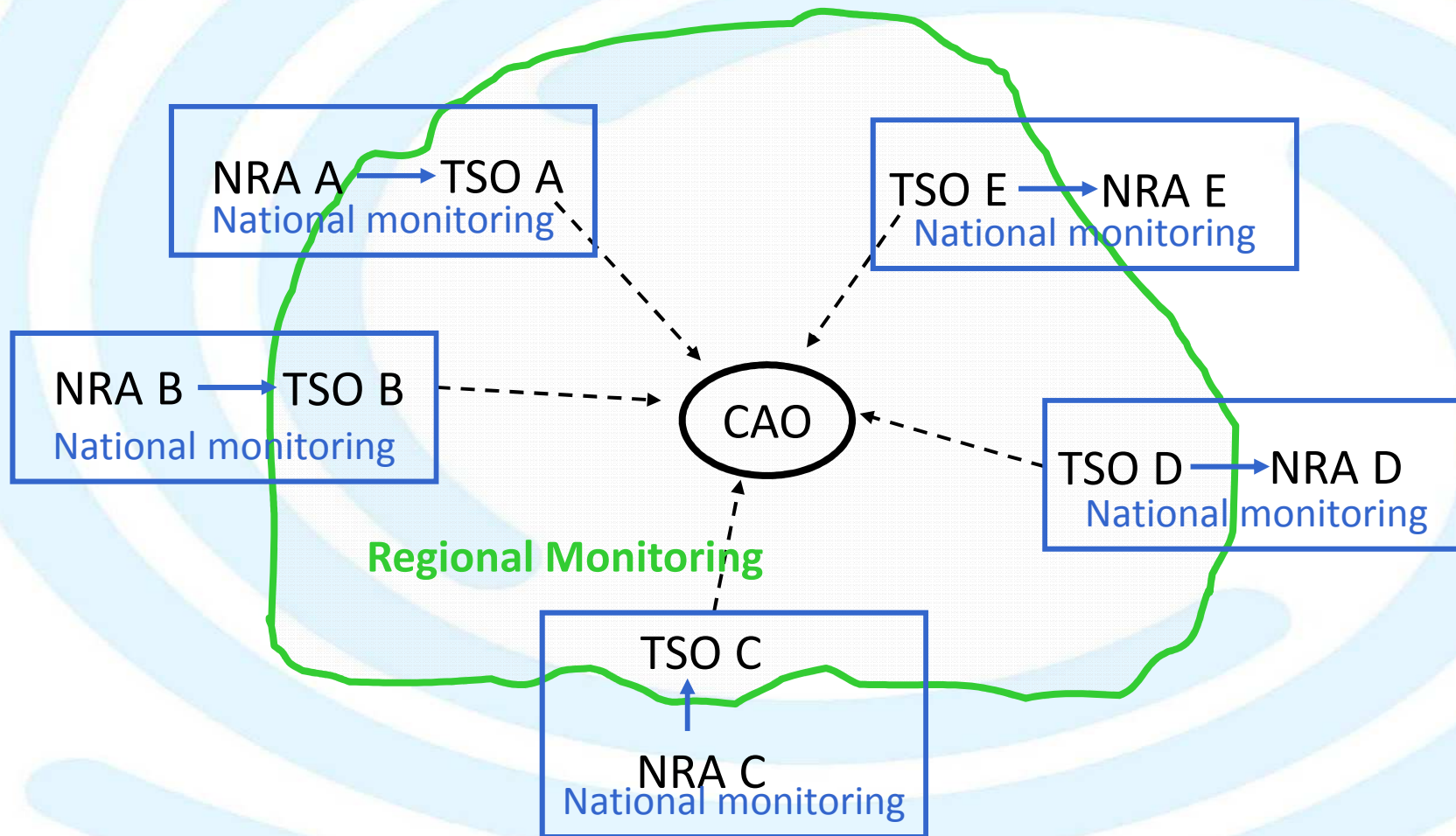
# Reporting

## Quarterly Reporting

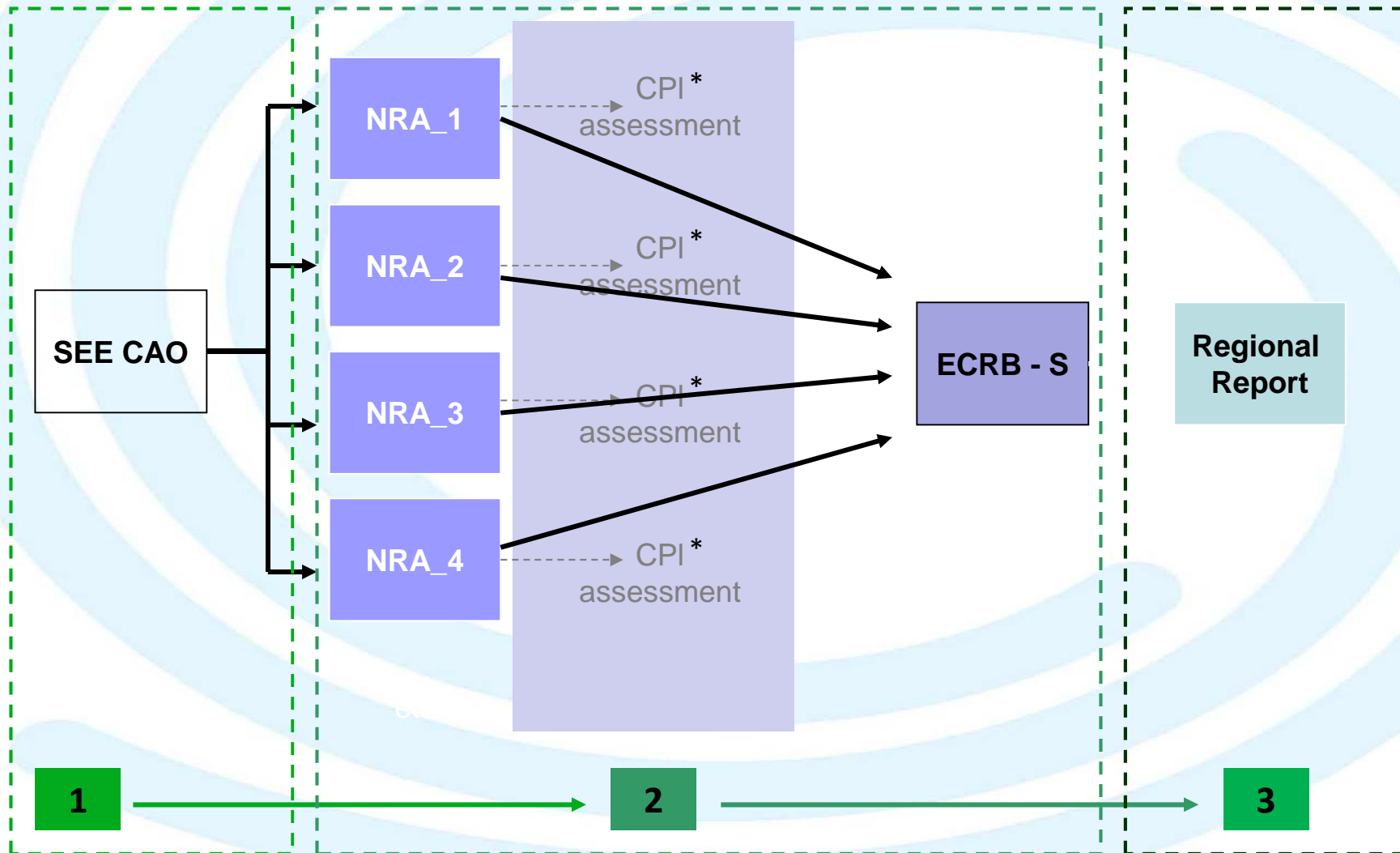
- ▶ Reports would summarize:
  - the results of the monthly screens
  - other activities, follow-up (such as information requests to participants), other market impediments
- ▶ Special reports could be issued when clearly identified problems emerge as a result of screening and follow-up information



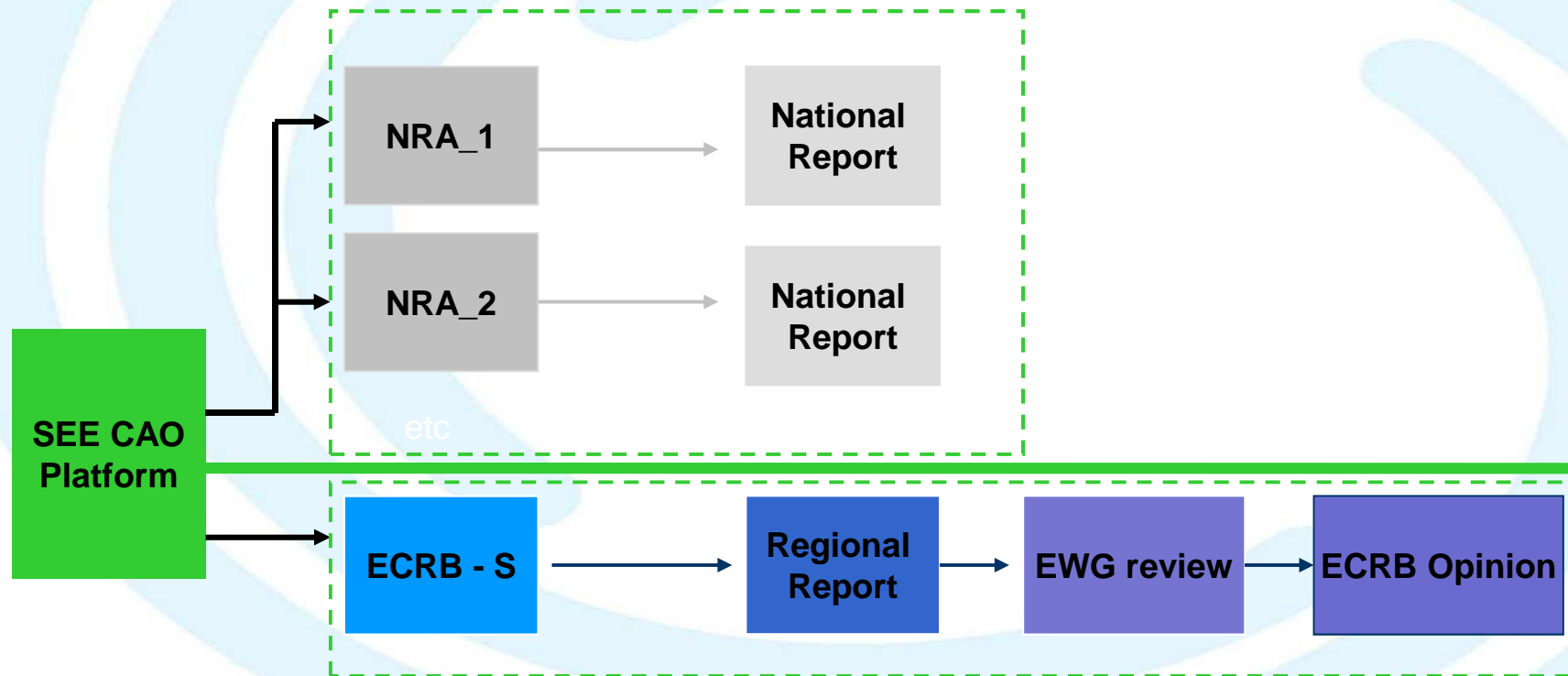
# SEE CAO Monitoring: ECRB Position: 2 layers – national & regional



# SEE CAO Monitoring: How to undertake regional CAO monitoring?



# SEE CAO Monitoring: Option discussed by ECRB



# SEE CAO Monitoring: Details of CAO Monitoring model under discussion

- **FORMAT/PROCEDURE**

- ◆ SEE CAO to establish a data platform
- ◆ Access for:
  1. NRAs → national monitoring of compliance with rules approved by NRA according to powers
  2. ECRB Section → regional monitoring report ([1] quarterly reports, [2] weekly tables?) → ECRB/ECS?

- **WHICH DATA?**

- a. IMPLEMENTATION AUCTION RULES*

- ◆ National and regional monitoring

- b. MARKET PERFORMANCE*

- ◆ Regional report to assess independently ECRB/ECS? (→)
- ◆ Not beyond powers of NRAs !
- ◆ Beyond powers of NRAs → left to NRAs to cooperate to competition authorities etc.



## SEE CAO Monitoring: Next Steps

- CA/CAO Monitoring mostly concentrated on procedural issues in this phase
- Indicator definition and explicit data requirements shall be postponed as EWG cannot define or discuss it before SEE TSOs issue Draft SEE CAO Auction Rules
- Should regulators/EWG be included in the work on drafting SEE CAO Auction Rules from the very beginning, or wait for the final draft version of the document, drafted by PT?
- SEE CAO and Regional CA/CAO Monitoring entity, e.g. ECRB-S or ECS, shall require an advanced data electronic base and software which would enable producing all kind of raw CA/CAO Monitoring data in table format upon explicit request at all time horizons: daily, weekly, monthly, etc.
- More detailed reports which would include comparisons and analysis in written form could be produced on longer time period, e.g. monthly level

## Hot questions on MM in SEE

- ▶ Who will “coordinate” NRAs in the monitoring process?
- ▶ Who will facilitate the “Regional Analysis”?
- ▶ Who Publishes Reports?
- ▶ We ask:  
*can the Dry Run Process be converted to a permanent “Live” Process?*
  - Who will undertake the function of the USAID Consultant?

## Next Steps

### Next Steps

- ▶ EWG develop MM Guidelines – in 2012
- ▶ ECRB approves Guidelines – in 2012
- ▶ ECS or ECRB facilitates cooperation among NRAs and EWG and contributes regional analysis for periodic reports – in 2012
- ▶ MM Dry Run and SEEAMMS continues to develop further additions to the Guidelines that will be reviewed by EWG and approved by ECRB
- ▶ Through USAID, Potomac Economics continues transition support to ECRB-S and EWG

## Regional Balancing Mechanism: RBM Dry-Run

- BETSEE Dry-Run performed on 18 Nov 2009 with broad participation of SEE TSOs and regulators (almost all EWG members participated!)
- Main goal of Test Run was: sharing experience, witnessing many interesting situations as well as some unexpected occurrences → not only to learn how to drive, but also to detect where are the limitations and the room for further improvements
- After Dry-Run, SEE TSOs addressed technical comments on software usage and EWG members sent their own comments
- Next steps: SEE TSOs made the final report (including gained experiences, some open issues clarification) → SEE TSOs discussed possible future steps (organized within new ENTSO-E structure)
- SEE TSOs decided to stop the project for a while due to the fact that day-ahead and intraday transmission capacity allocation are still not introduced in SEE Region and wait for its implementation firstly



## Regional Balancing Mechanism: Main goals

- Based on SEE TSOs concept, the **final aim** of RBM is:
  - To **increase margins** of balancing **resources** for SEE TSOs
  - TSOs obtain Balancing Energy (BE) in **short period** and under **competitive market prices**
  - To help TSOs to **provide** necessary **tertiary reserve** (fast and slow) easily (emergency help)
  - To **ensure safe** and **secure** system operation
  - To **reduce TSOs costs** for providing BE
  - To give opportunity to national **market players** to **offer** their short-term electricity **surpluses** via BETSEE/TSOs platform with lower prices



## - 'SEE' regulators' views on RBM Implementation: National BM vs. Regional BM

- **Coexistence** of national balancing mechanisms and RBM
- TSOs **keep long-term** balancing **contracts** (reservation of production capacity/power)
- RBM/BETSEE represents **actual state of play** of market participants **offers** for BE depending on momentarily situation, introduced on BETSEE internet platform
- **RBM** itself **cannot be** a reliable source of BE for TSO needs on continuous basis
- **Regulator's** obligation is to **check** if TSO is buying BE at the lowest market price, and TSOs obligation is to chose BE offer at lower price
- RBM is **voluntarily** based



## - 'SEE' regulators' views on RBM Implementation: Cross-border capacities for RBM

- **Residual** cross-border capacities are available for RBM → remaining capacities, not wanted by any other market participant just before the real time (have no value) → free for RBM
- Residual cross-border capacities are **assigned** on “**first come-first serve**” basis to involved TSOs at RBM
- To ensure that **TSO do not act as “trader”** and make profits out of the system (mediator between market participant and other TSOs)
- Could be achieved through **close cooperation** between involved **Regulatory authorities**

## Regional Balancing Mechanism: Next Steps

- Balancing modalities, especially Regional Balancing in the 8<sup>th</sup> Region, should be fully **in line with ex-ERGEG experiences** on Regional Balancing → “Final Revised Guidelines of Good Practice on Electricity Balancing Markets Integration”, published by ERGEG (future ACER FG)
- Unfortunately, not all SEE TSOs are in favor to continue the work on RBM project stating that it is **not a priority** for SEE region
- SEE TSOs (ENTSO-E RG SEE) stopped working on the RBM proposal
- SEE regulators issued regulatory review of ex-SETSO BM SGs Examination Paper on RBM based on ECRB EWG discussions
- RBM could be implemented only after SEE CAO is fully established in the 8<sup>th</sup> region (implementation of day-ahead and intraday transmission capacity auctions)



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