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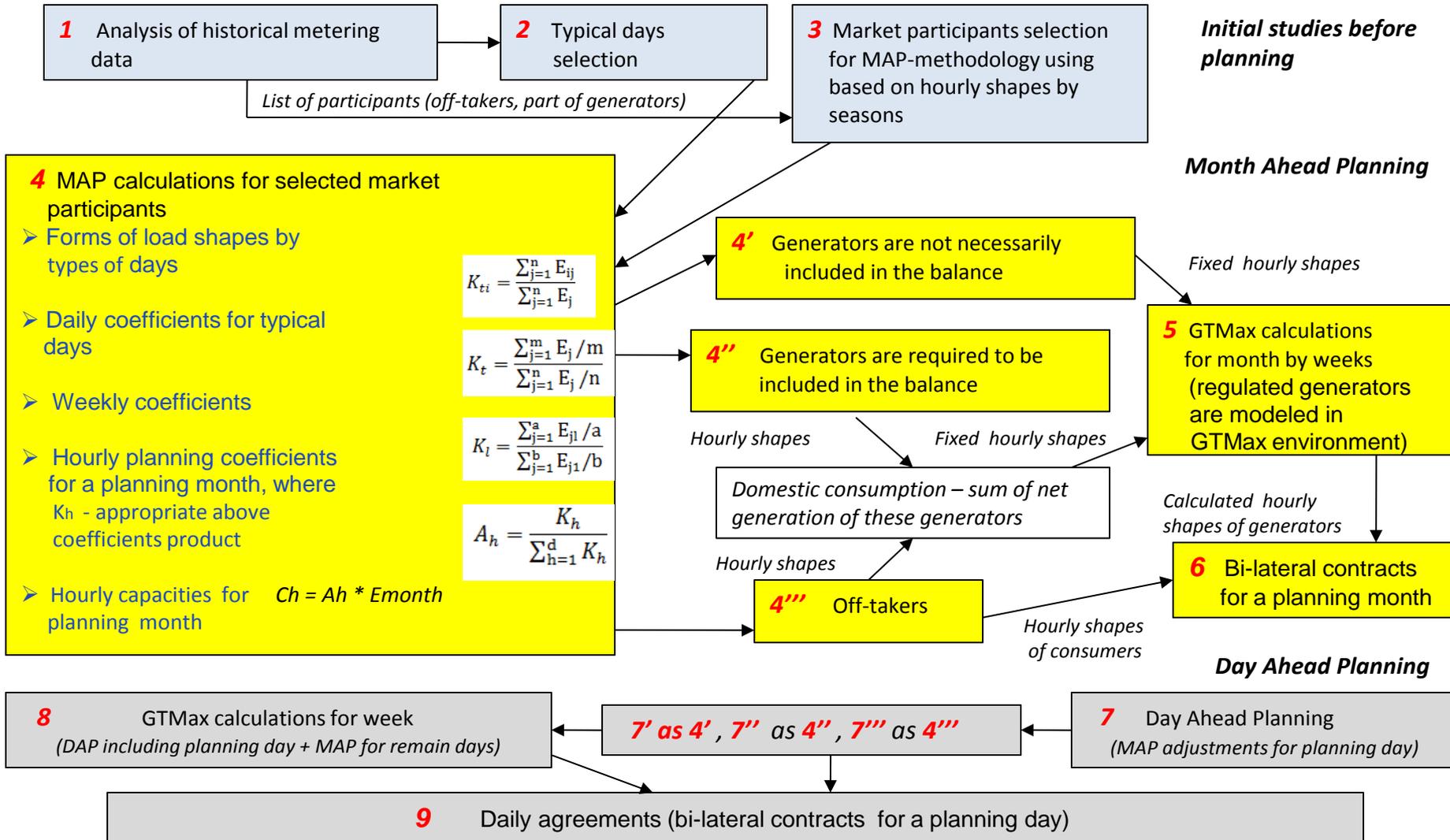
**HYDRO POWER AND ENERGY  
PLANNING PROJECT (HPEP)**

# **HOURLY BI-LATERAL CONTRACTS (Monthly and Daily)**

**December, 2013**



# DAP/MAP and bi-lateral contracting methodology





## **Bi-lateral contracts**

***The main purpose of new system of hourly bi-lateral contracts is to use “take or pay” principle without any adjustments.***

**Three basic options of bi-lateral contracting are considered:**

**Model 1.** *Full pool;*

**Model 2.** *Partial pool + free negotiation amongst market participants on a monthly basis;*

**Model 3.** *Partial pool + free negotiation among participants on a monthly and daily basis .*



## **Bi-lateral contracts (continued)**

**Model 3 appears the most feasible and it is chosen as the base model.**

There are two proposed types of contracts for planning month.

**Type 1 Partial pool (full matrix) – selected generators by seasons and all consumers (maybe part of off-takers)**

In this case, main purpose of bi-lateral contracts is to minimize the generation price for domestic consumers and also allocate the generation (including expensive) between all domestic consumers “fairly by volumes”.

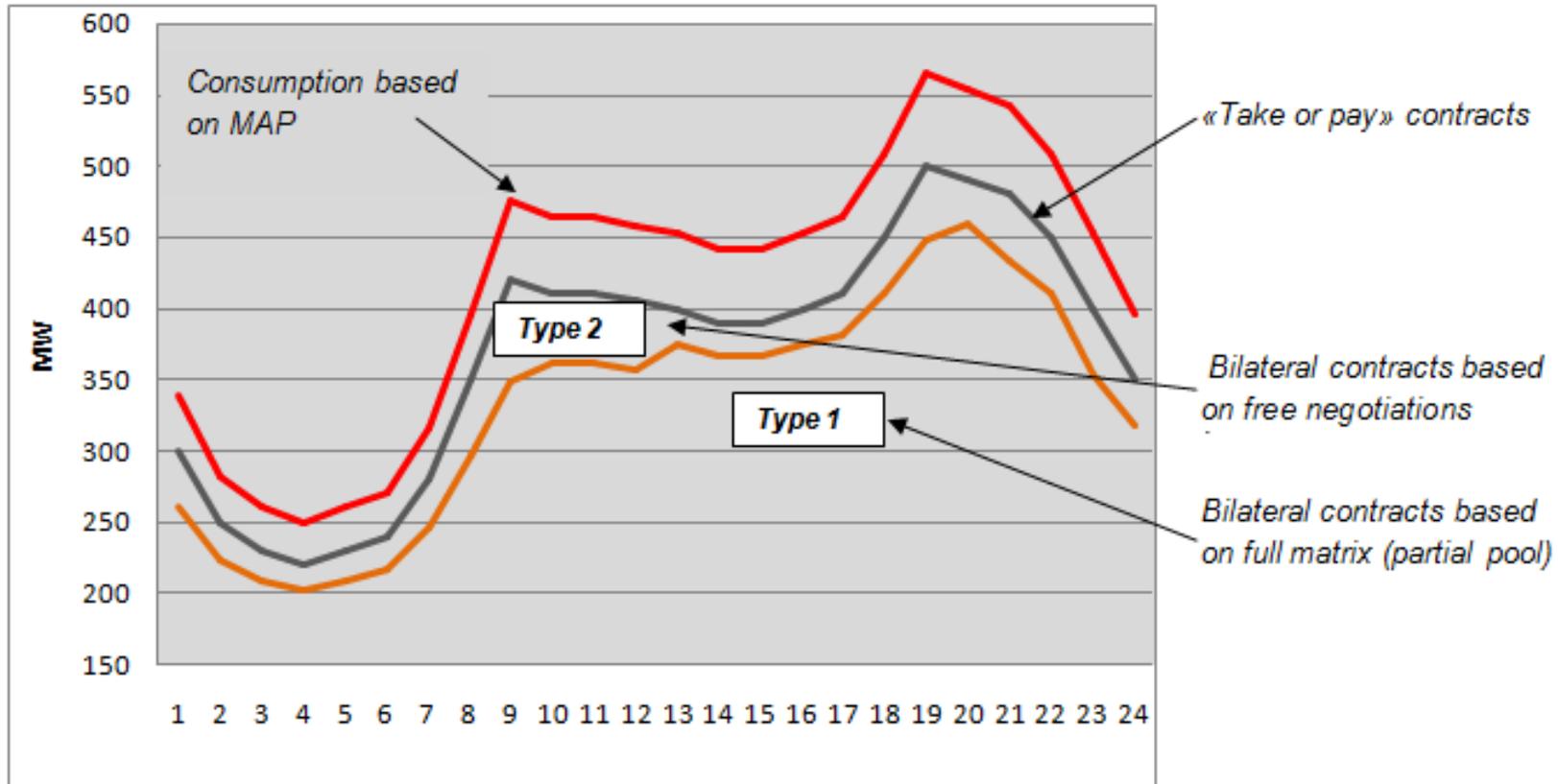
**Type 2 Free negotiations between market participants**

This type of contract corresponds to today's practice, but in the future, they should be on an hourly basis.



## *Bi-lateral contracts (continued)*

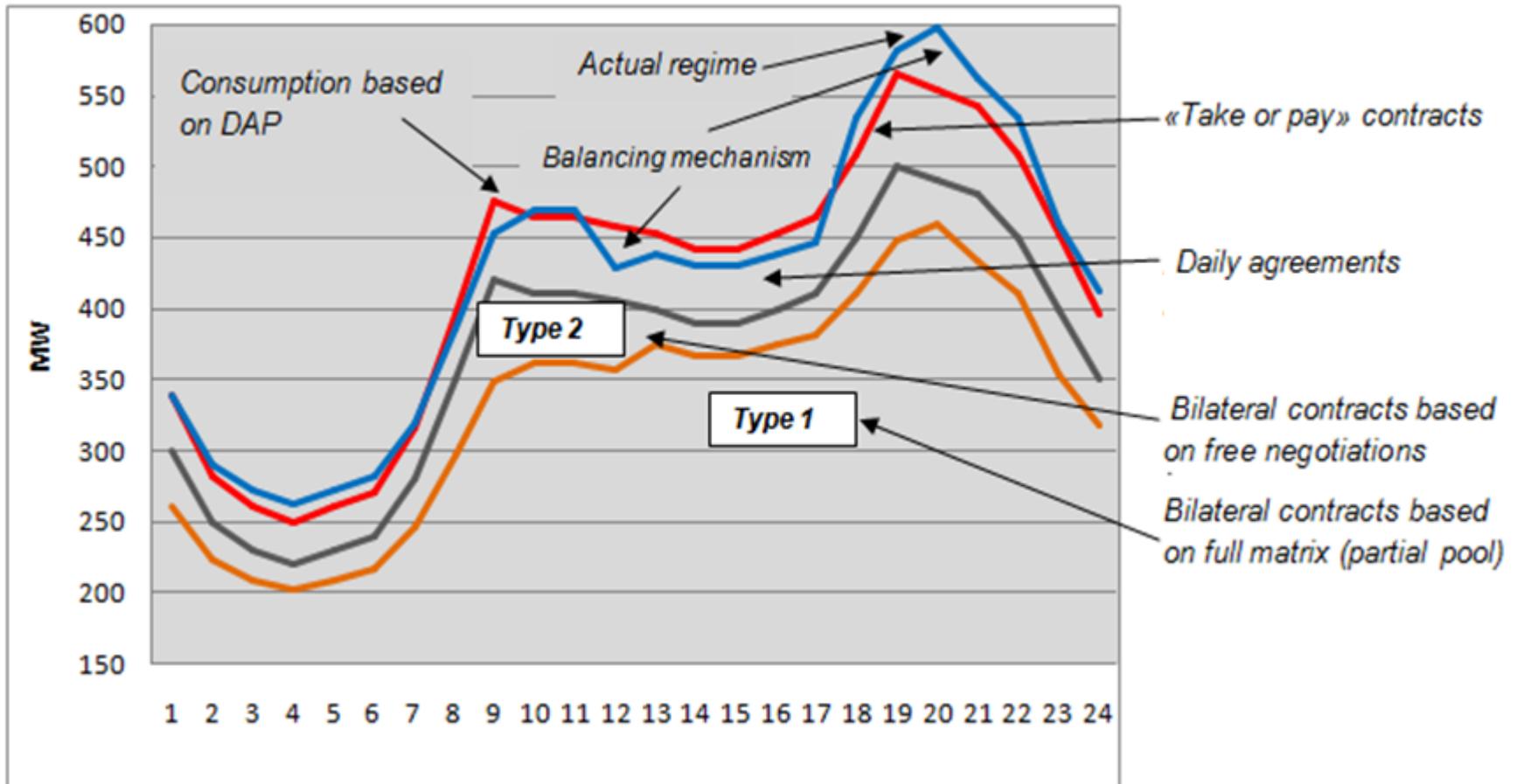
### Contracts on monthly basis





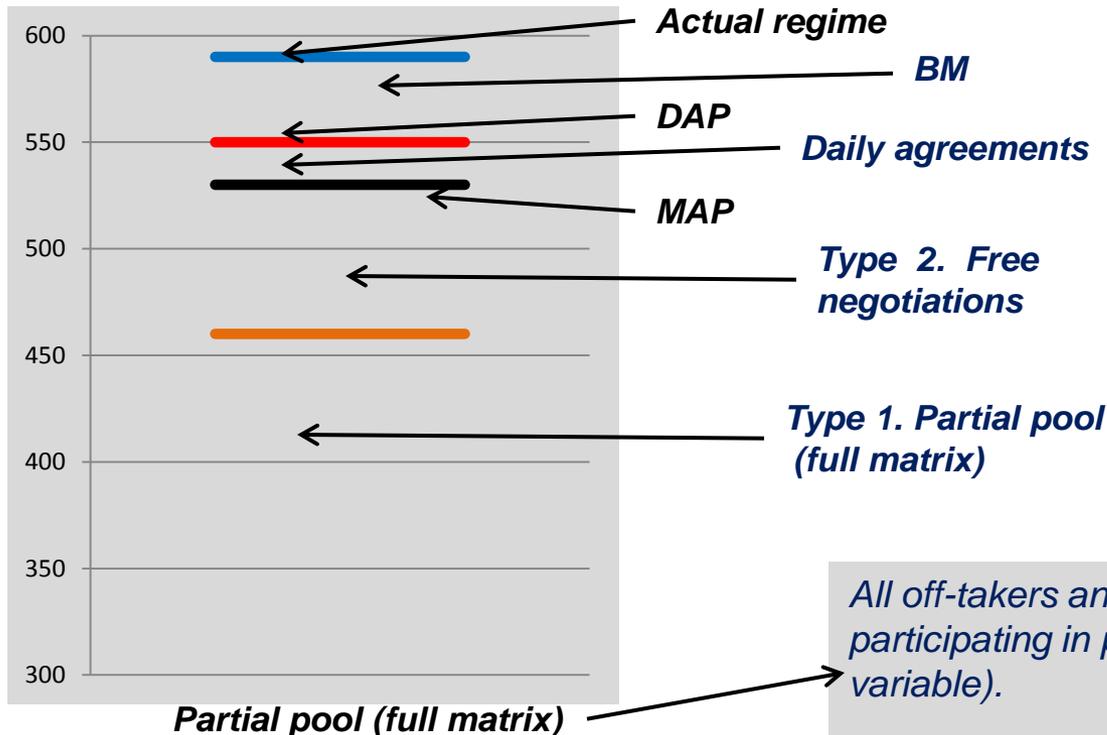
## *Bi-lateral contracts (continued)*

### Contracts and balancing





## Electricity trade for one hour (example)



In this example for off-taker for one hour **MAP is fully covered by bi-lateral contracts** (Types 1 and 2).

Difference between DAP and monthly bi-lateral contracts is covered by **daily agreements**

In any case **balancing mechanism** is a difference between actual regime and sum of bi-lateral contracts regardless of sign of deviation.

*All off-takers and selected generators by seasons are participating in partial pool (we propose  $N=constant$ ,  $M$ -variable).*

*ESCO (trader) can be included in generators list as well as in off-takers*

*For each off-taker bi-lateral with each generator are determined in proportion of consumption for each hour (i)*

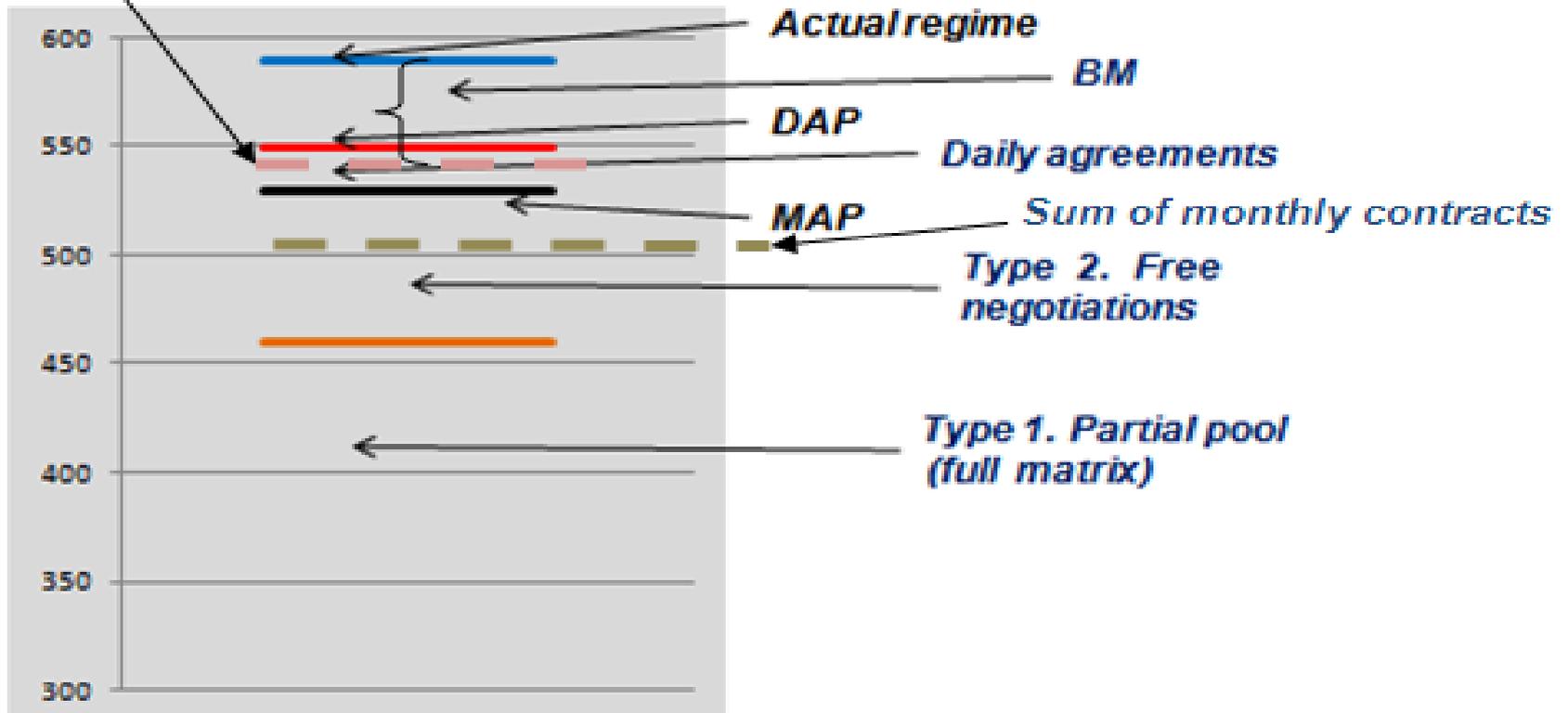
	Off-taker 1	.....	Off-taker N
Generator 1	$a_{11i}$	.....	$a_{1ni}$
.....	.....	.....	.....
Generator M	$a_{m1i}$	.....	$a_{mni}$



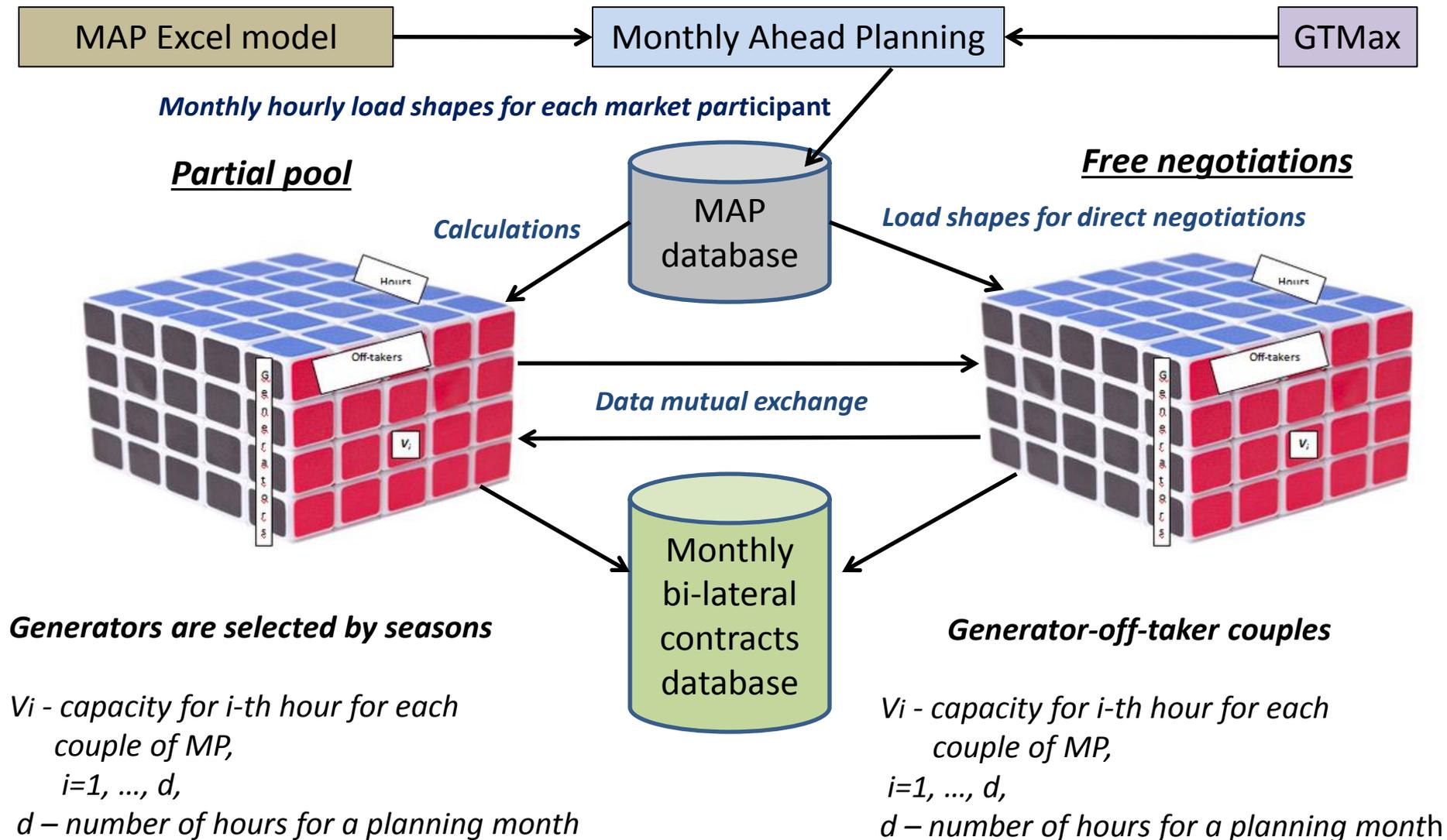
## Electricity trade for one hour (example, continued)

***DAP/MAP is not fully covered by bi-lateral contracts***

*Sum of bi-lateral contracts*

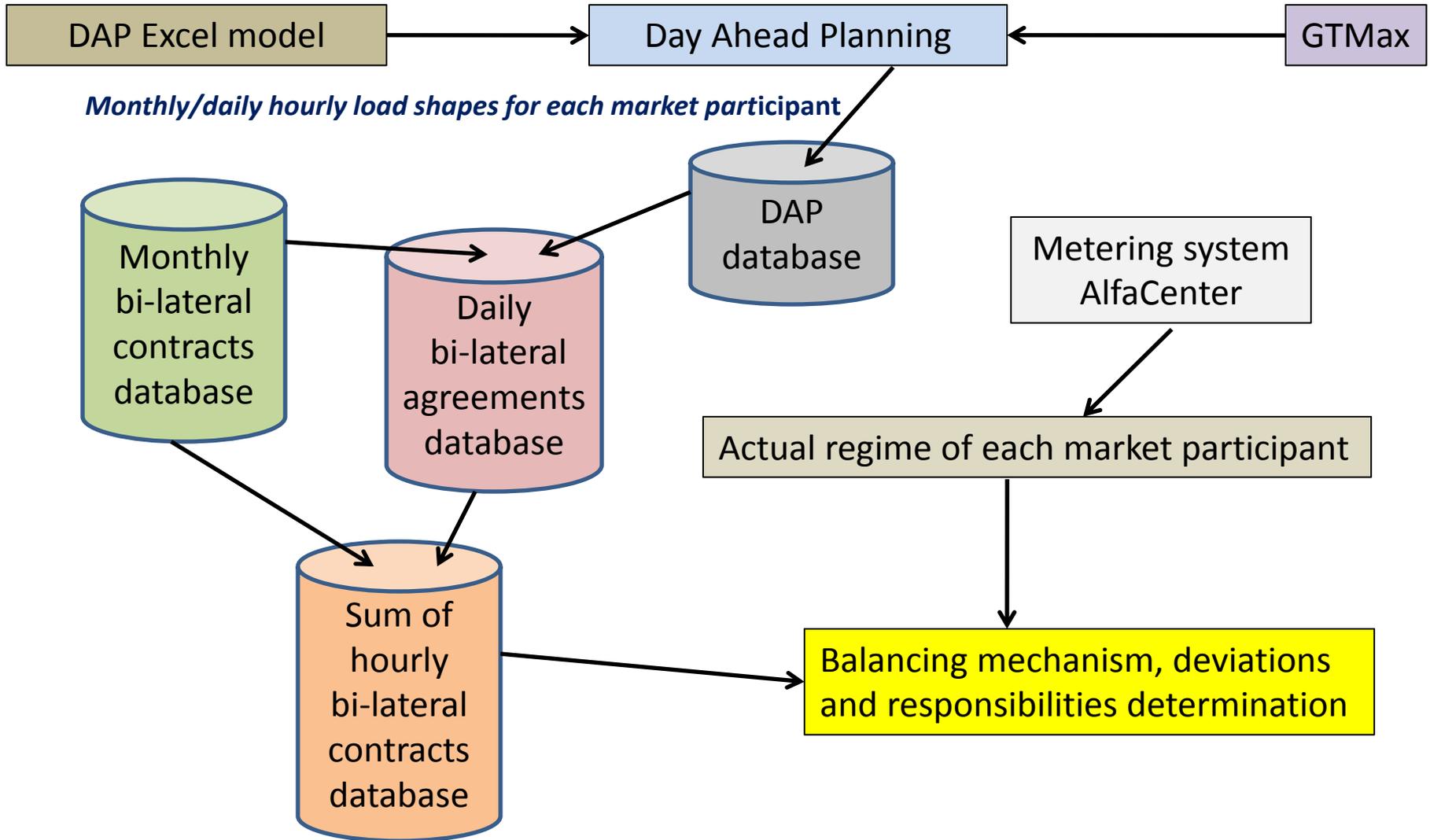


## Model for monthly bi-lateral contracts





## *Model for daily bi-lateral agreements and balancing*



## Output Excel forms

Form 1

<i>Sum of monthly volumes of bi-lateral contracts in MWh</i>					
Generators (import) / off-takers (export)	1	2	...	M	Total
1					
2					
...					
N					
Total					

Form 2 – same in accordance with partial pool, Form 3 – same based on free negotiations

Form 4

<i>MP / Month, Year</i>	<i>Sum of daily volumes of bi-lateral contracts in MWh</i>													
MP / DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1														
...														
N (for off-taker),														
M (for generator)														

Form 5 – same in accordance with partial pool, Form 6 – same based on free negotiations

Form 7

<i>MP1-MP2 Month, Year</i>	<i>Sum of bi-lateral contracts volumes by hours in MW</i>													
TIME/DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
00:00-01:00														
01:00-02:00														
02:00-03:00														
03:00-04:00														
04:00-05:00														
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19:00-20:00														
20:00-21:00														
21:00-22:00														
22:00-23:00														
23:00-24:00														
Total														

Form 8 – same in accordance with partial pool, Form 9 – same based on free negotiations

Appropriate forms for daily agreements and sum of all bi-lateral contracts to be created.

Using actual regime data and volumes of the sum of bi-lateral contracts the deviations can be determined.



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*Thank you*