

Taller: Modelización de Energías Renovables

Despacho Eléctrico



(setiembre 2016 – Bs. Aires)
CENTRO DE ESTUDIOS DE LA ACTIVIDAD REGULATORIA ENERGÉTICA
y Subsecretaría de Escenarios y Evaluación de Proyectos del MINEM

Módulo 6.
Incorporación de Pronósticos de
Generación al despacho.
Generación de señal de precio,
demanda con respuesta y posibles
sinergias que podemos tener entre
los sistemas.

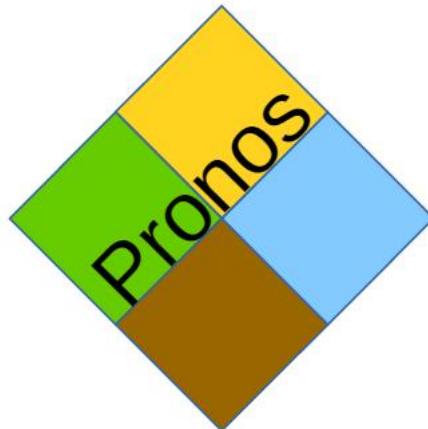
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UNIVERSIDAD
DE LA REPÚBLICA
URUGUAY



Fundación
Julio Ricaldoni
INGENIERÍA EN EL URUGUAY

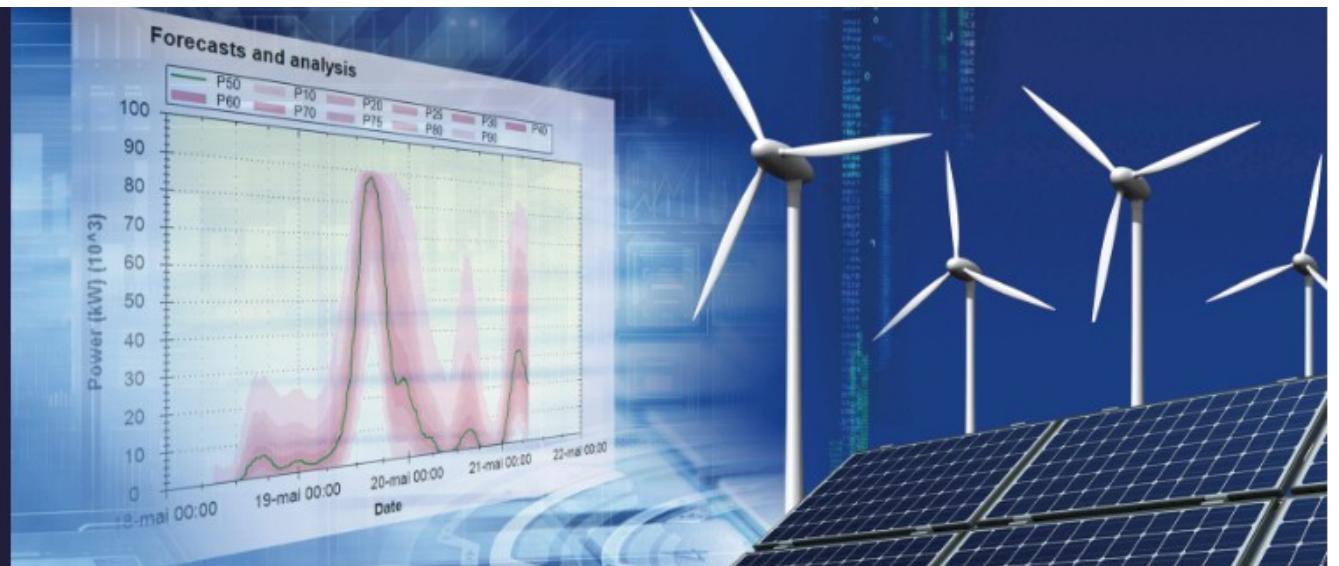


Pronos: Proyecto de Incorporación de Pronósticos de generación eólica y solar a la operación del sistema eléctrico.

Incorporación de pronósticos de generación eólica y solar a la operación del sistema eléctrico

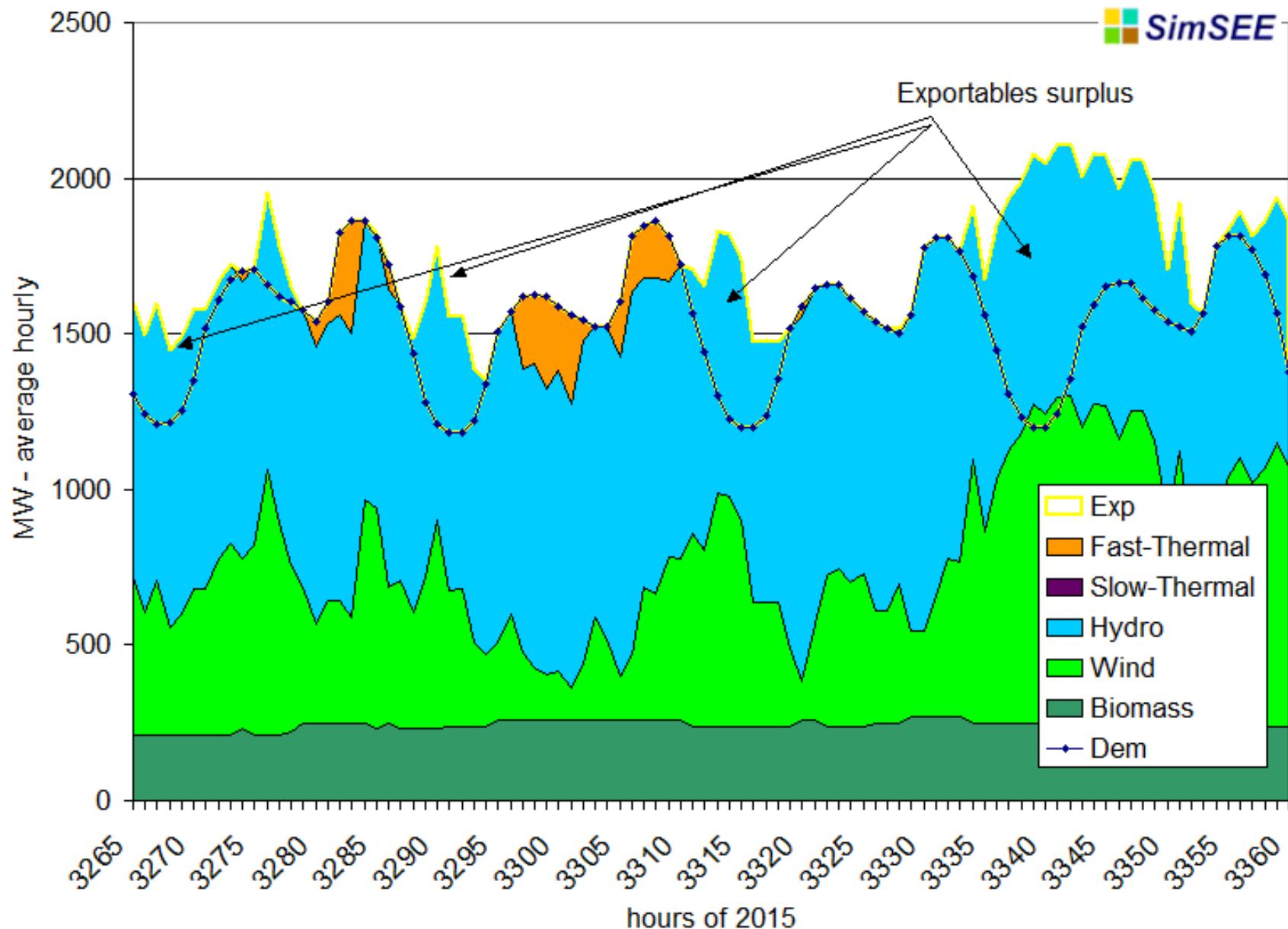
4 y 5 de agosto 2016
MONTEVIDEO - URUGUAY

 
BANCO DE DESARROLLO
DE AMÉRICA LATINA

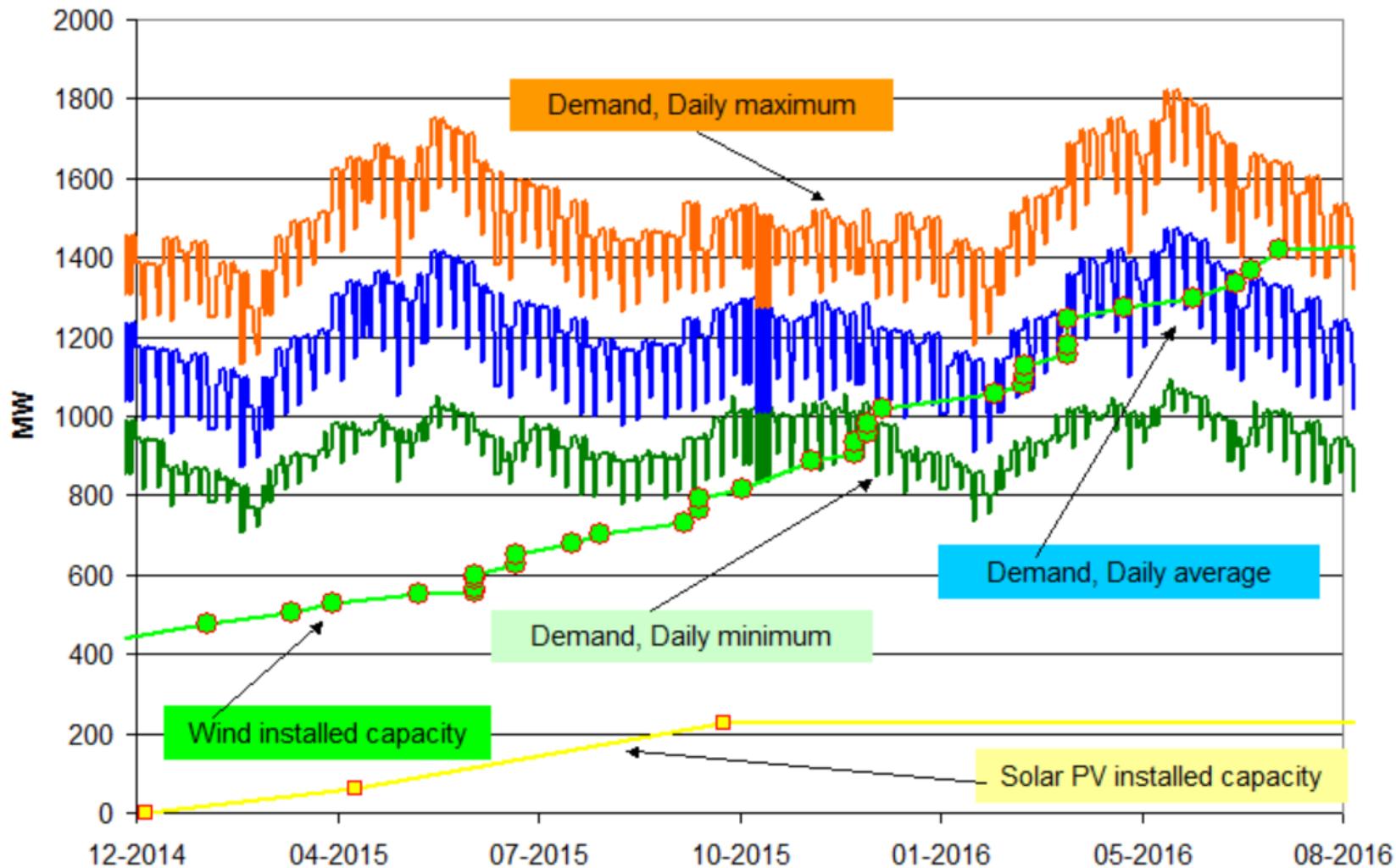


http://pronos.adme.com.uy/trabajos_presentados.html

Generation by source on a specific stochastic realization
days of springer with high values of inflows to the hydroelectric plants.



Wind capacity vs. System load.



This work



This work shows an approximation to definition of a price signal that can be used by smart controllers distributed over the grid to manage such demands. Simulations of the proposed algorithm are carried out showing that the stability of the system is achievable.

We need new loads capable of defer/advance the consumption...





Electric vehicle for citizen usage.

Storage capacity equivalent to
two days of the expected travel.

Autos Eléctricos de UTE

Julio de 2014: primeras 30 unidades
Diciembre de 2015: segundas 30 unidades
¡La mayor flota dedicada en Sud América!



Kangoo Maxi Z.E. RENAULT

Características técnicas:

- Consumo de energía 155 (Wh/km)
- Autonomía 170 km bajo ciclo NEDC
- Potencia nominal de motor 44 kW / 60 hp
- Velocidad máxima 130 km/h
- Capacidad de carga útil 650 kg
- Volumen de carga 4.6 m³
- Sistema de frenos regenerativos
- Tecnología de Banco de Baterías Lithium Ion
- Capacidad de almacenamiento de energía de (LWh) 22kWh
- Aire acondicionado frío-calor
- Airbag chofer y acompañante
- Frenos ABS / AFU
- Radio con Bluetooth/cd/fm/am
- Dirección Asistida
- Portón lateral



Water heater.

60-90 lt storage capacity.

Daily target temperature for a
programmed hour.

Cloud of loads with statistic behavior



Real time tariff.



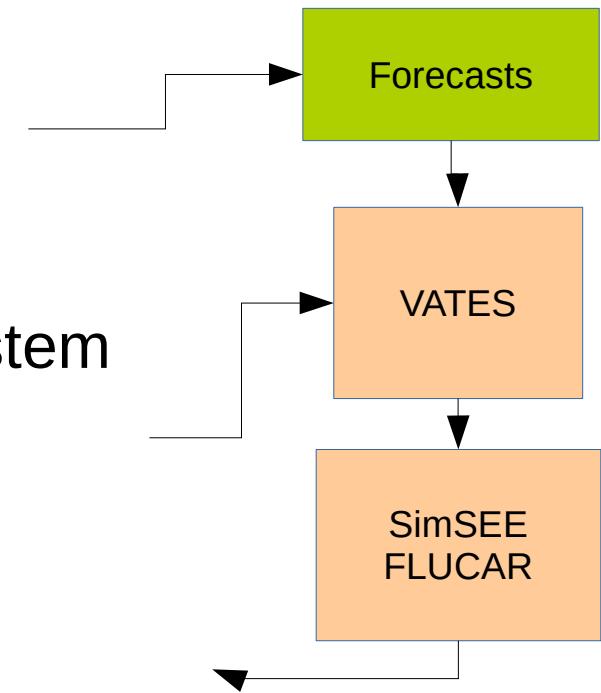
- In real time forecast to the next 72 hours
- The Smart Controllers will try to allocate consumption in the cheaper hours.

Starting building blocks



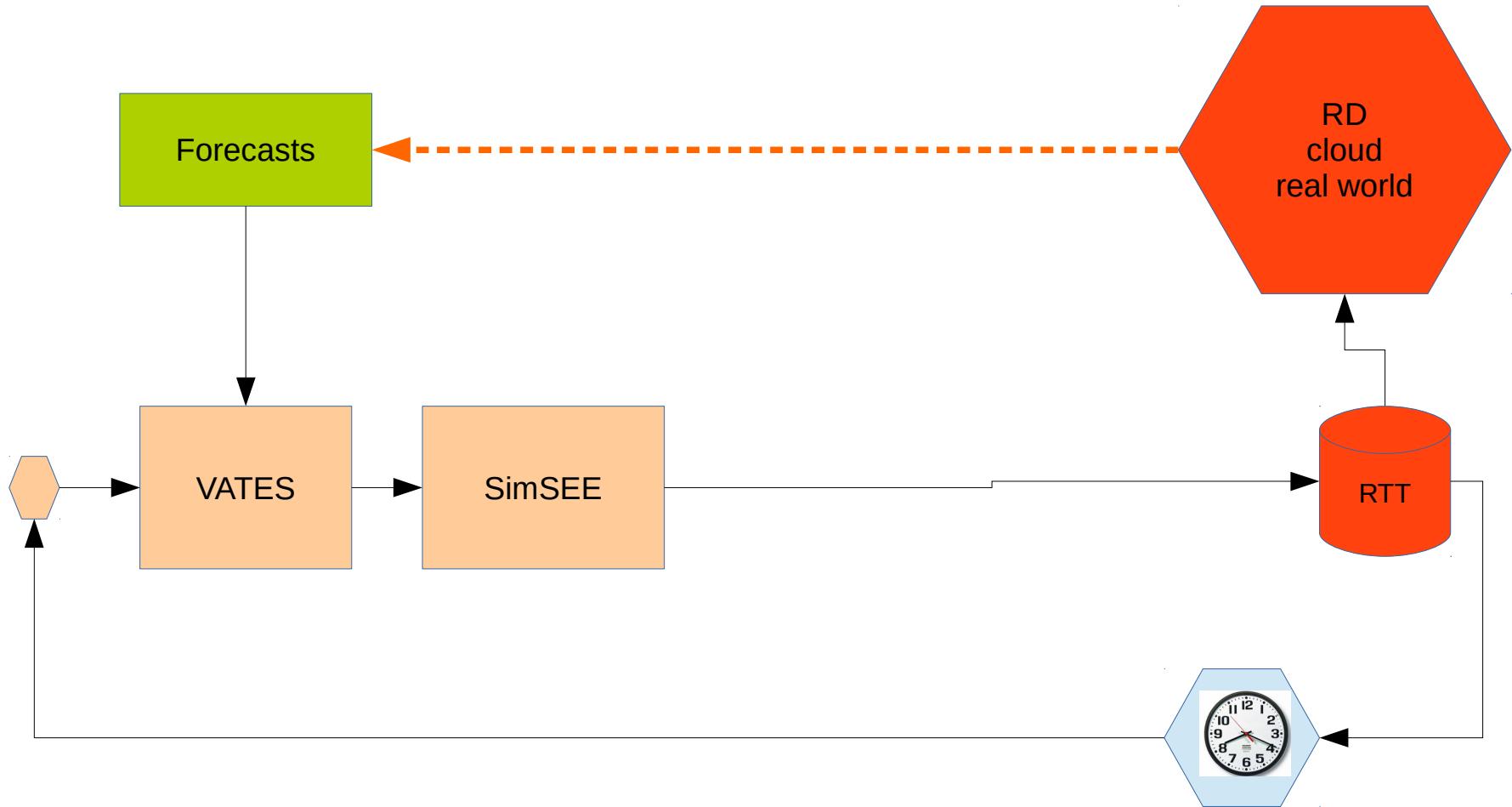
Hydro-Solar
Temperature

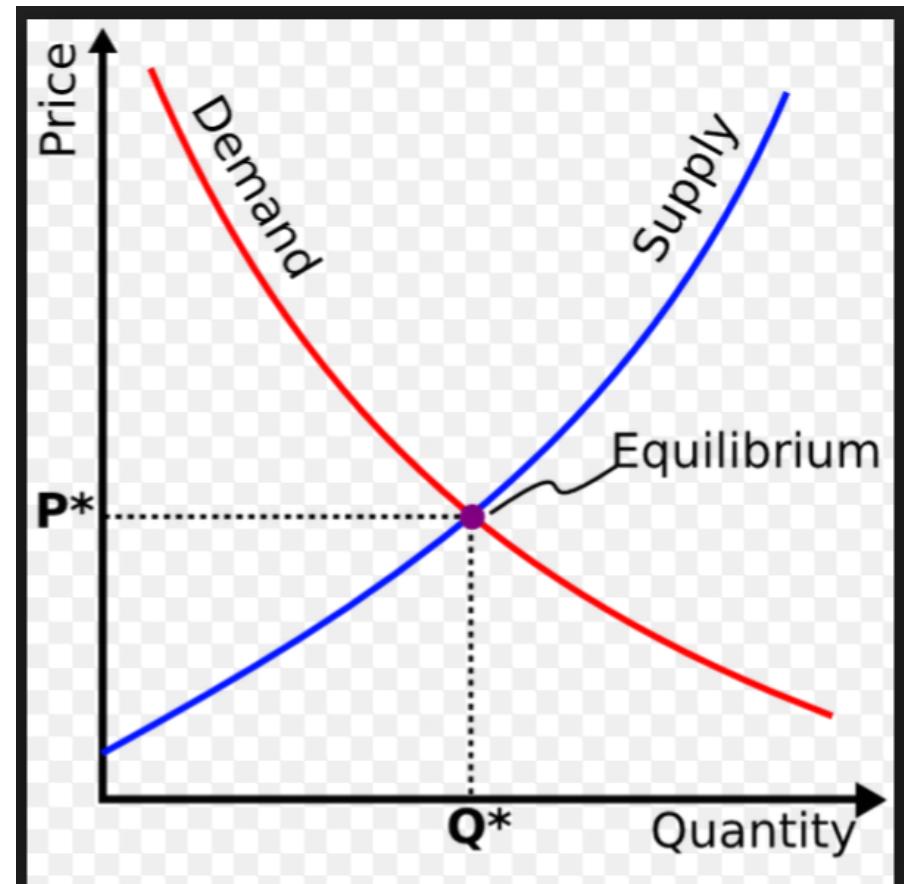
Real time system
Status info.



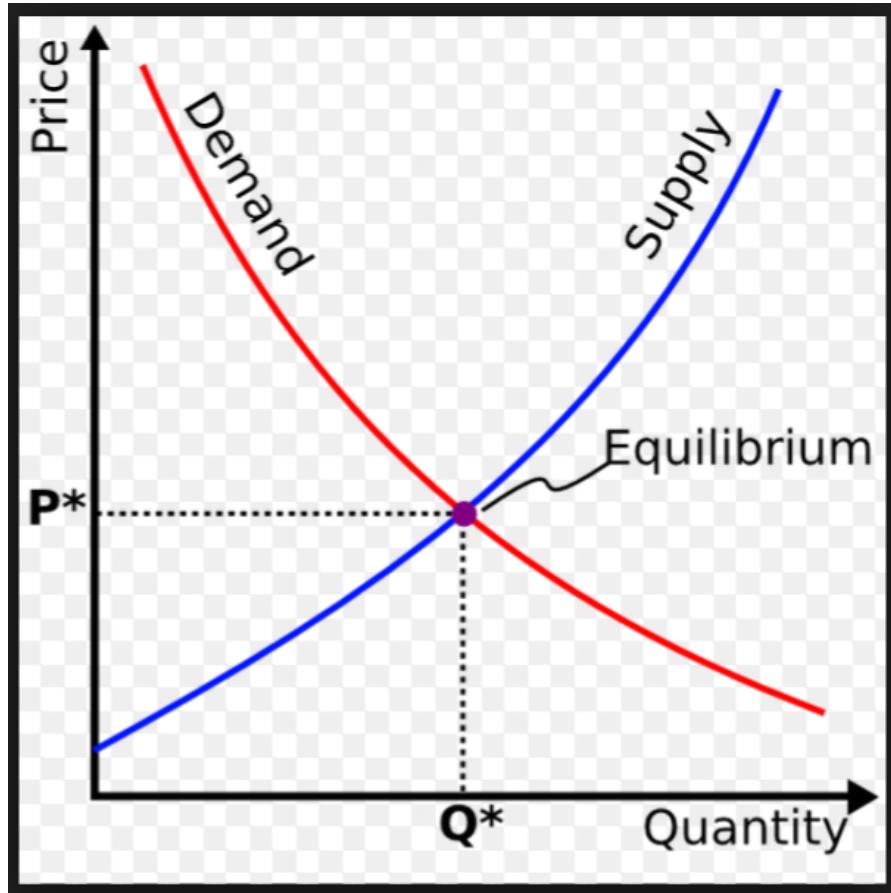
Hourly marginal cost at
each Node of the grid for
the next 72 hours.

Closing the loop.





It is no true.

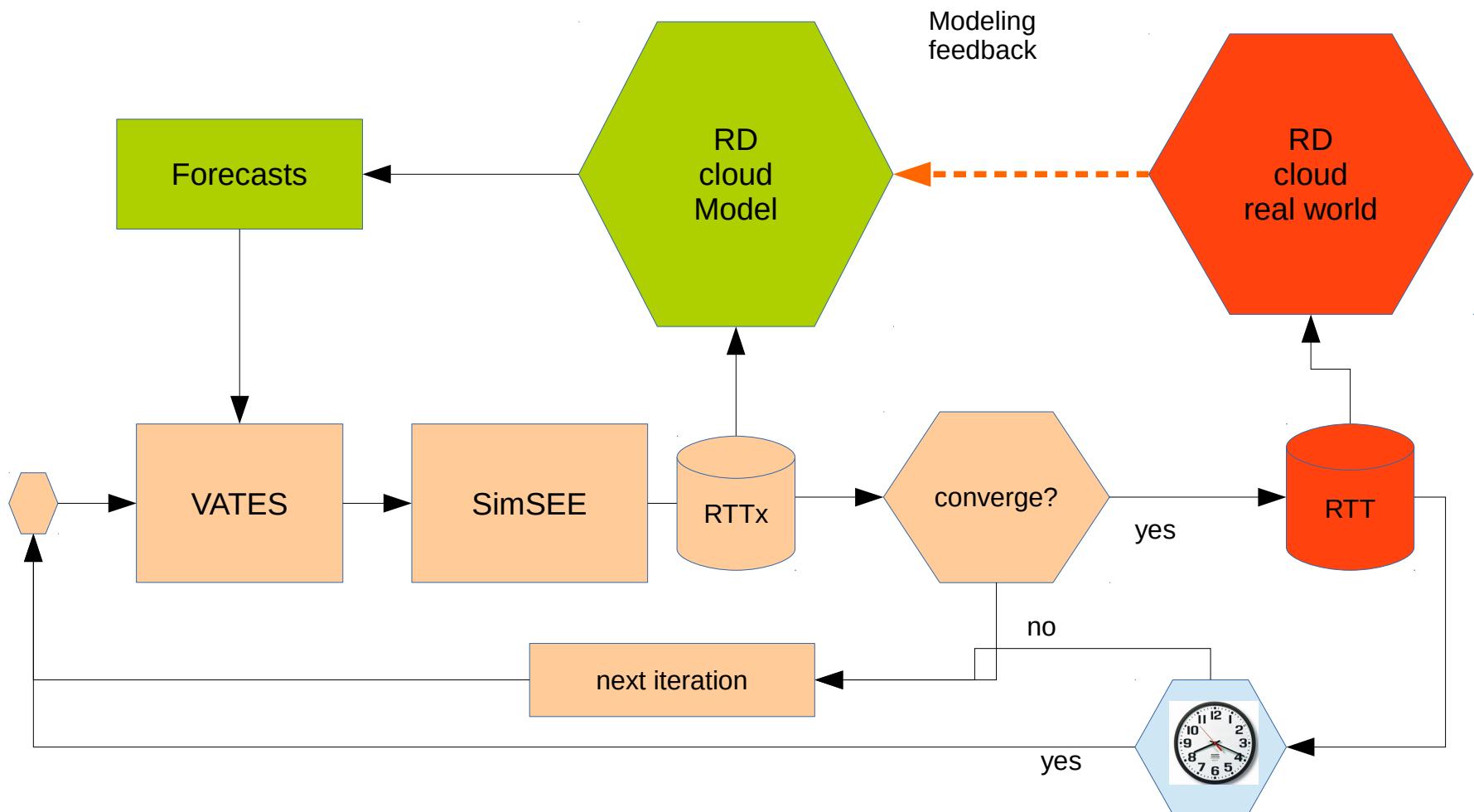


- You need the EV charged every day.
- You need the water heater every day.
- You want to buy at the cheaper hour.
- There are not elasticity.

Real time tariff and demand reaction.

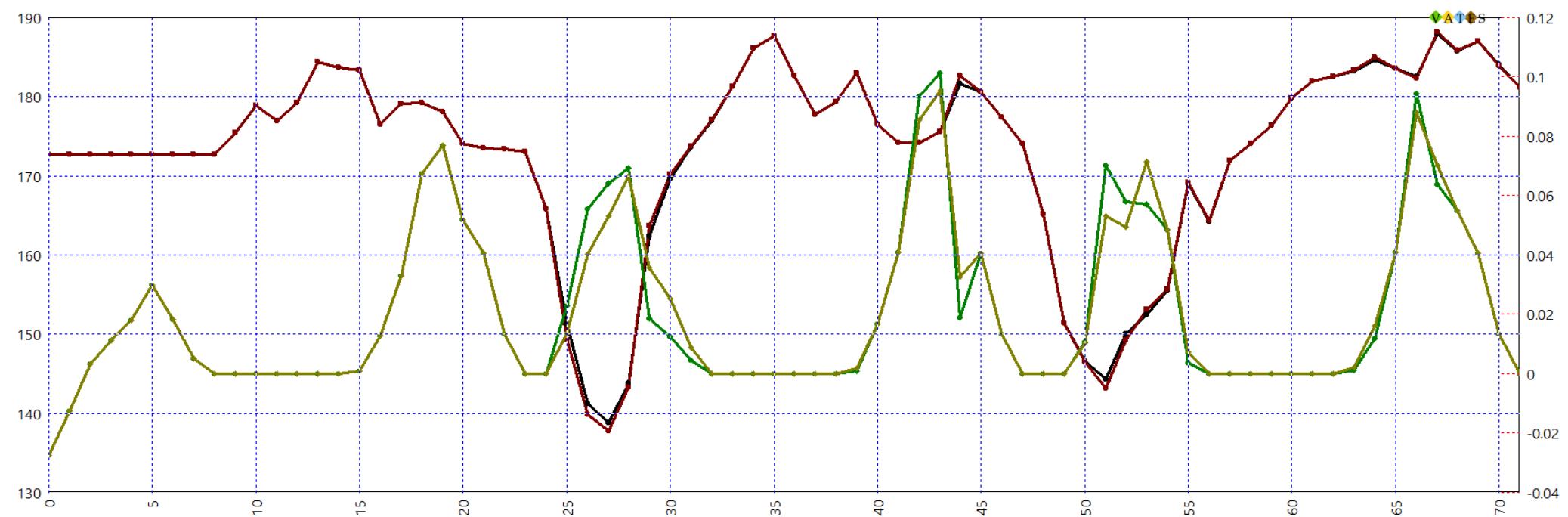


- In real time a forecast to the next 72 hours is published.
- The Smart Controllers will try to allocate consumption in the cheaper hours.
- The marginal cost of the cheaper hour of the forecast will increase do to the increase in the consumption of that hour.

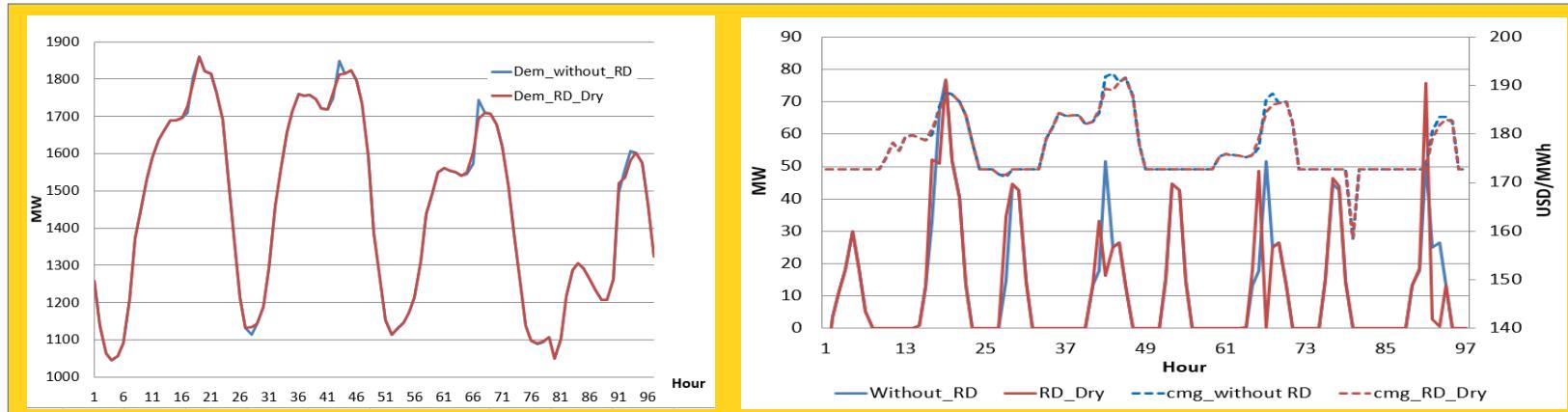


Avoiding oscillations

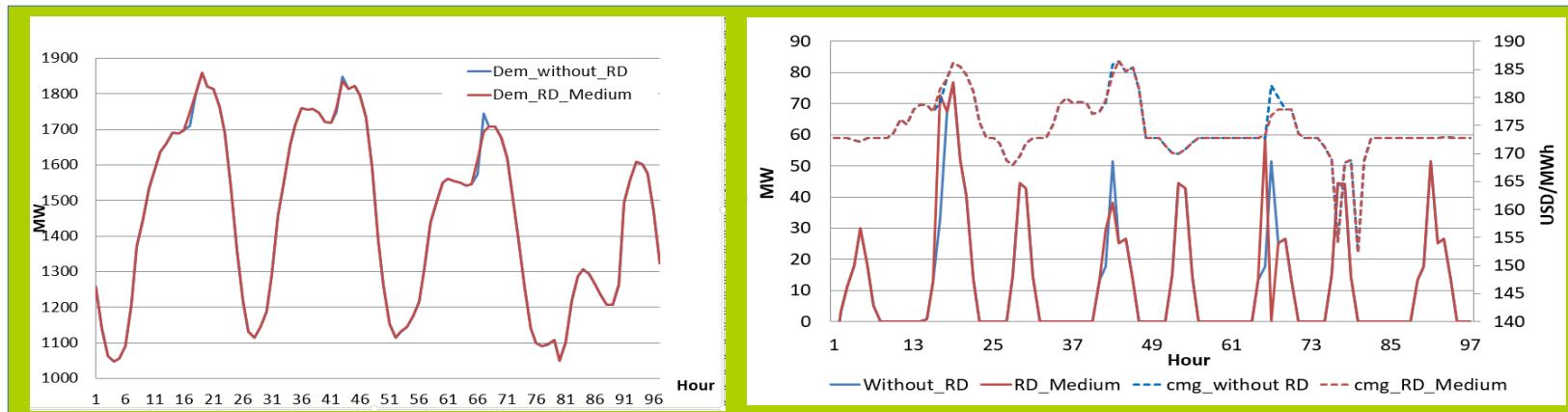
- Model of the cloud of RD with self-learning mechanism.
- The distributed controllers ask for the tariff forecast no more than one time every hour.
- The best forecast is given any time.



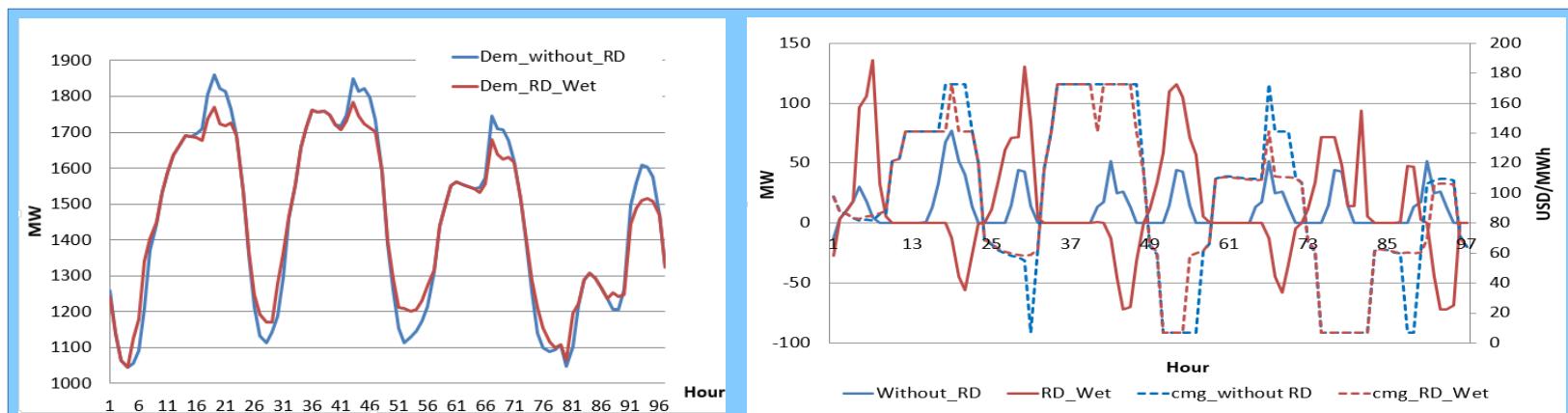
Dray



Medium



Wet



We must be agile to keep the train
... and not get on the wrong.



Thanks a lot for your time!