



Renewable penetration levered by Efficient Low
Voltage Distribution grids



Pitch 4: RESOLVD Forecasting tool

Presenter: Quim Melendez
Universitat de Girona (UdG)

joaquim.melendez@udg.edu

Short presenter's bio

Joaquim Meléndez

Telecom Engineer (1991) and PhD (1998)

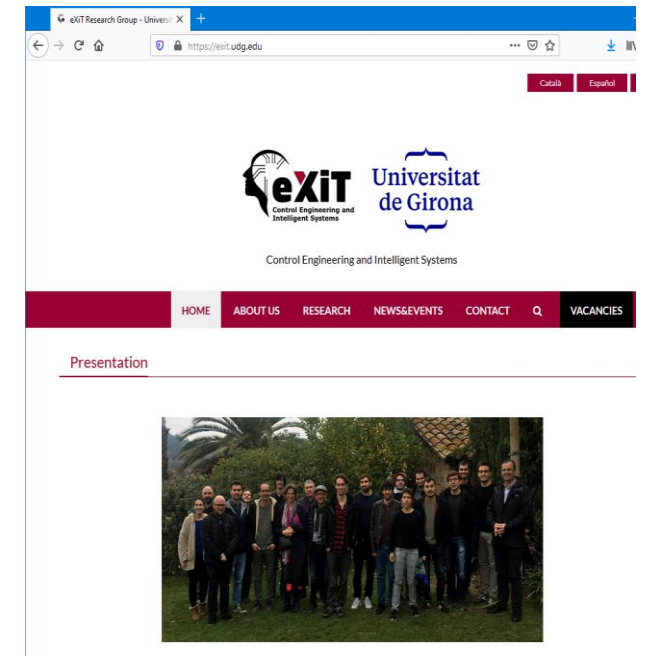
*Staff member of the Electric, Electronic and Automation Engineering Department of the Universitat de Girona and Head of the **eXiT** research group and Director of the Girona SmartCity Chair.*

IP of the RESOLVD project



Universitat de Girona

***eXiT** is a research group of the Universitat de Girona focused on the **application of artificial intelligence principles** (data mining and knowledge discovery, problem solving and optimization, etc.) and data **driven methods** (machine learning) to support decision-making processes in energy systems.*



Energy Forecasting

Basic problem:

- **How much energy?**
- At specific time instant, time horizon and granularity



Demand
Generation

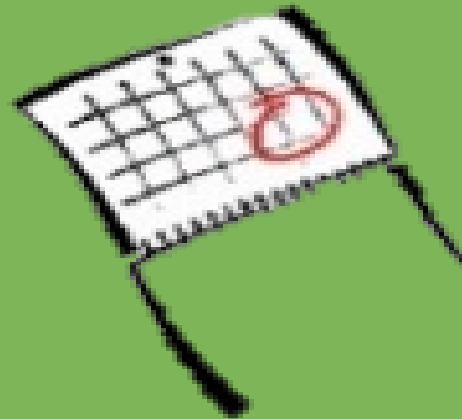


Energy Forecasting

Basic problem:

- **How much energy?**
- At specific time instant, time horizon and granularity

Use of relevant information



...

Demand
Generation



Energy Forecasting

Basic problem:

- **How much energy?**
- At specific time instant, time horizon and granularity

Demand
Generation

Applications:

- Flexibility and Demand response programmes (energy market players)
- Prevention of critical events (smart grids management)
- Energy efficiency and management (microgrids, energy hubs, buildings)
- Measure and Verification projects (ESCOs and facility managers -IPMV-)
- Energy budget control and accounting (energy managers)
- ...



Energy Forecasting

Basic problem:

- **How much energy?**
- At specific time instant, time horizon and granularity

Principal Drawbacks

- Adequacy of solutions
- Data Quality
- Quality of forecasting

RESOLVD approach

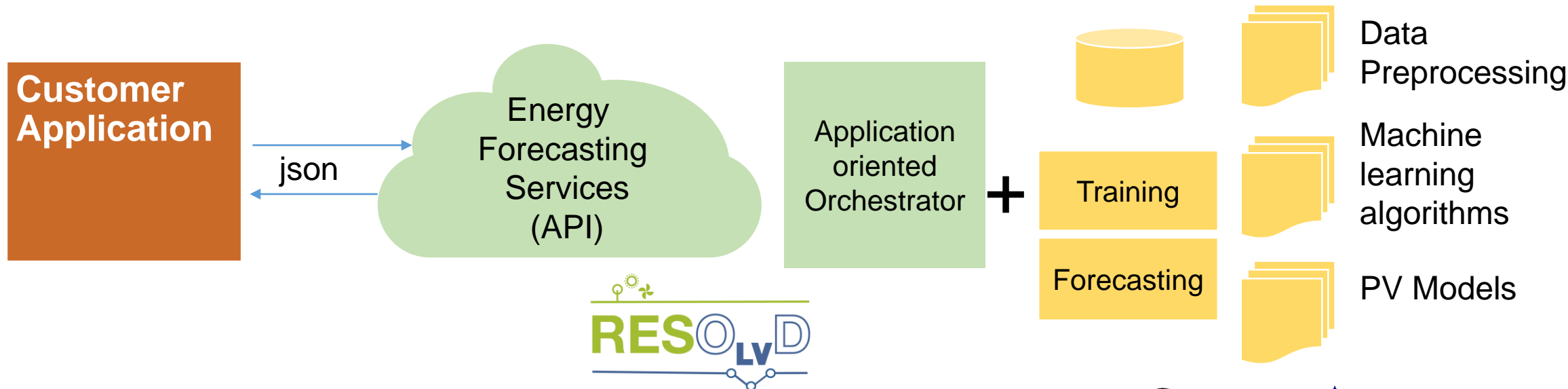
- Easy customization and integration
- Data integrity checking and preprocessing
- State of the art of machine learning methods

Energy Forecasting

Basic problem:

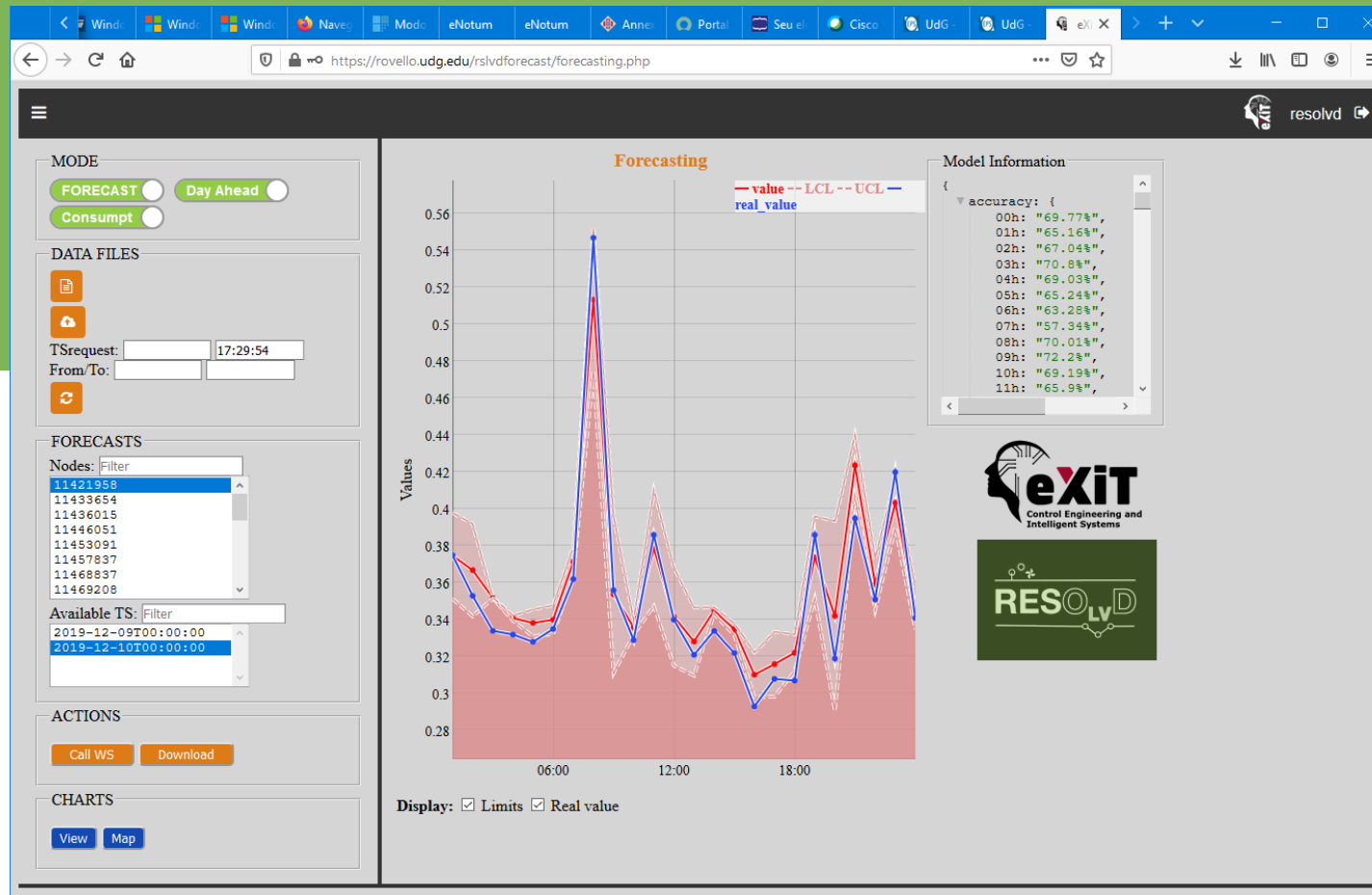
- **How much energy?**
- At specific time instant, time horizon and granularity

Goal Oriented solution:



Energy Forecasting

Example: Web client



Energy
Forecasting
Services
(API)



Energy Forecasting

Example: Web client

TS	temperatura	radiation
2020-03-12 00:00:00	10.3	0
2020-03-12 01:00:00	10.3	0
2020-03-12 02:00:00	10.3	0
2020-03-12 03:00:00	10.3	0
2020-03-12 04:00:00	10.3	0
2020-03-12 05:00:00	10.2	0
2020-03-12 06:00:00	10.2	0
2020-03-12 07:00:00	10.8	32
2020-03-12 08:00:00	12.9	194
2020-03-12 09:00:00	15.7	395
2020-03-12 10:00:00	18.3	545
2020-03-12 11:00:00	20.1	662
2020-03-12 12:00:00	21	676
2020-03-12 13:00:00	21.1	628
2020-03-12 14:00:00	20.7	591
2020-03-12 15:00:00	20	500
2020-03-12 16:00:00	19	375
2020-03-12 17:00:00	17.1	185
2020-03-12 18:00:00	14.1	34
2020-03-12 19:00:00	11.7	0
2020-03-12 20:00:00	10.8	0
2020-03-12 21:00:00	10.3	0
2020-03-12 22:00:00	10.2	0
2020-03-12 23:00:00	10.2	0
2020-03-13 00:00:00	10.2	0

Energy
Forecasting
Services
(API)

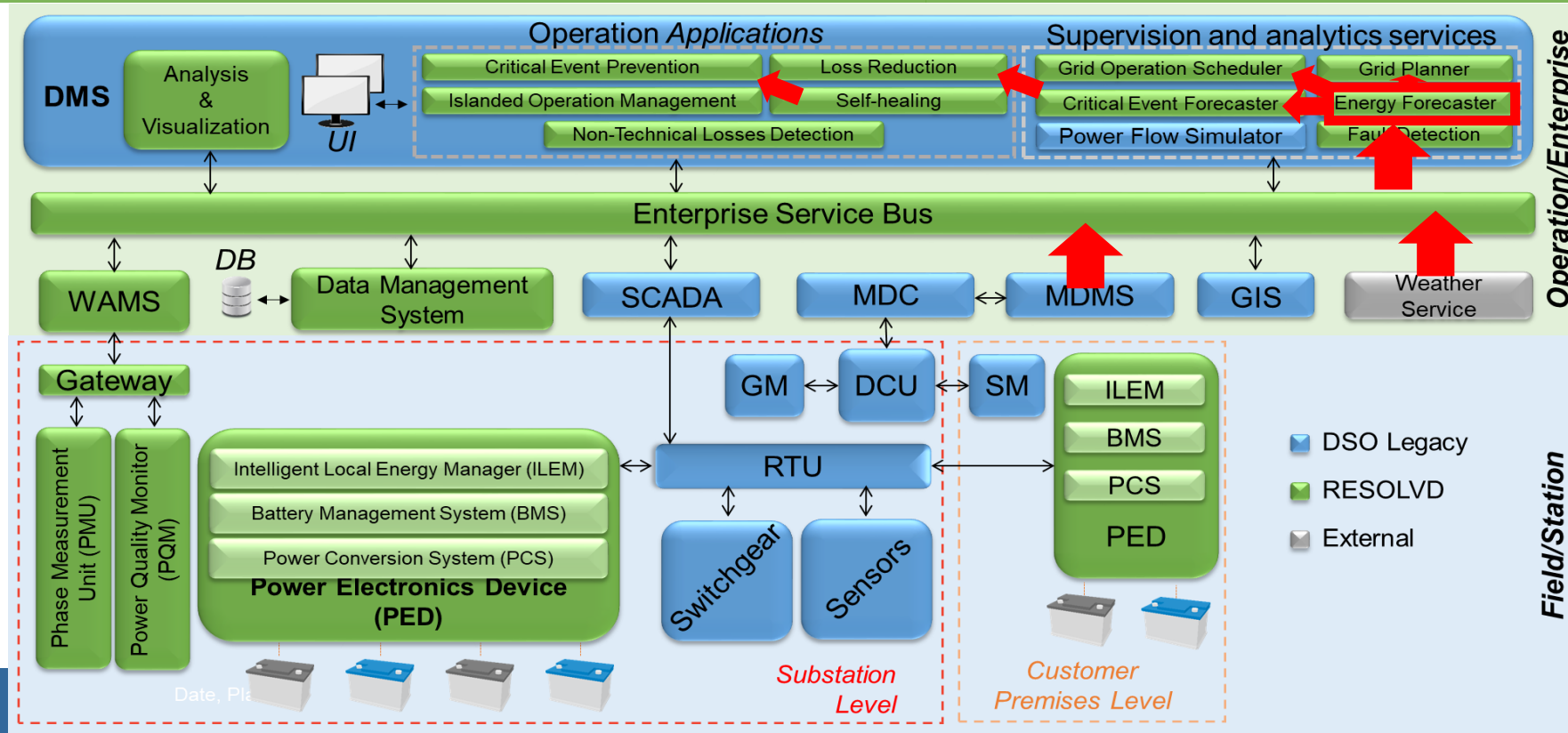
RESOLVD: Energy forecasting

Integrated in the DMS flows:

Forecasting as a Service for

- Grid Planning
- Critical Event forecasting and Prevention
- Loss Reduction Application

- Cybersecurity standards
- Data inputs: MDMS (SM), Weather
- Exchange format : JSON (CIM compliant)



Exploitation pathway

Highlights:

- Forecasting as a Service (FasS)
- Goal Oriented: Customizable to specific requirements
- Integrable with existing monitoring and management tools

Exploitation formula: Customisation + License

In continuous evolution:

- SotA forecasting methods
- Extension for multivector systems

Main target players:

- Energy/facility managers
- ESCOs (e.contracts / IPMV)
- DSOs (O&M)
- Aggregators and new market players
- Energy communities: REC/CEC
- ...
- Integrators and technology providers