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SMART CITIES Conference

Examples of smart solutions in energy, environment and transportation domains

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Presenter title: PhD
Company: XLAB d.o.o.

XLAB d.o.o.

About us

- Founded in 2001
- Member of Technology park of Ljubljana (Slovenia)
- More than 100+ experts (with partners) from fields of computer science, mathematics, physics...
- Strong research backgroud - largest private research company in Slovenia for EU founded projects

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Research projects

Our contributions

- Current projects:
  - EU FP7 (Finesce, Specs, Fortissimo, ACDC, MO-BIZZ, Cloud Scale, eBadge, Giraff+)
  - LLP (FLITE)
  - National (HPA, APRICOT, Liaas)
- Finished projects:
  - EU FP6/7 (mOSAIC, MOSAICA, Contrail, DIVeFor, Tossad, Pandora, XtreemOS, DeDiSys, Odyssey, SLA@SOI, SCALUS)
  - LLP (Connessione, Creatin, D-Facto, TrainOS, U-Coach, Pandora)
  - National (XCloud, DEDI, SPEU, KC RIS, Visualisation, Vodepro)

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Products and startups

- **ISL Online** | Remote desktop support and web conferencing software. Used worldwide by more than 120.000 companies including Canon, Konica Minolta, Coca-Cola, Deloitte, Fuji, Fujitsu, NEC, TNT, ... | http://www.islonline.com/
- **MedicView** | Medical imaging software in nuclear medicine, virtual colonoscopy | http://medicimaging.com/
- **Gaea+** | General Purpose 3D GIS with integrated Location Services for emergency response and spatial planing | http://www.gaeaplus.eu/
- **Koofr** | A hybrid storage interface solution | http://koofr.net/
- **Sentinel** | Advanced alerting system for boat owners | http://sentinel.hr/
- **Olaii** | Discover new events going on around you | http://olaii.com/
- **DataFy** | Big data approach in searching for business contacts | http://datafy.it/

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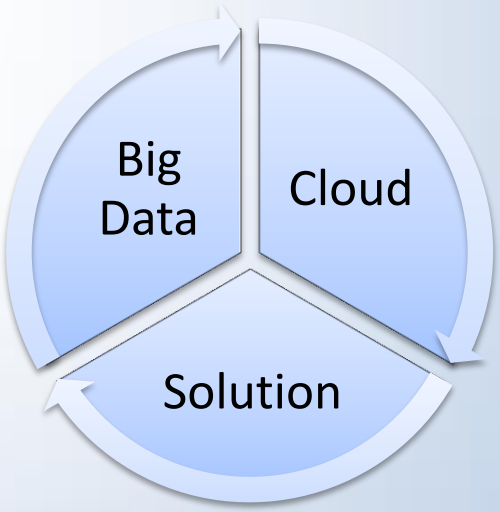
Smart city and solutions

Goals and cornerstones

- Wise management of resources
- Citizen well-being and safety
- Efficiency (competitive - traffic, pollution, etc.)
- Planning

Cornerstones for creating smart solutions and services

- Data collection and analysis
- Forecasting
- Data visualisation
- Notification
- Automatisation



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Smart city and solutions

Cornerstones in detail

- Data collection, monitoring, analysis
  - Online collaborative sensor data management platforms
  - Wireless sensor nerworks (custom devices & phones)
  - Participation of users
- Forecasting
  - Modeling and calculation (Big data)
- Data brokering and presentation
  - Services for action and/or nofitication
  - Visualisation tools
- Automatisation
  - Create another services using the services aggregating data

Xlab‘s know-how

Our input in smart city solutions

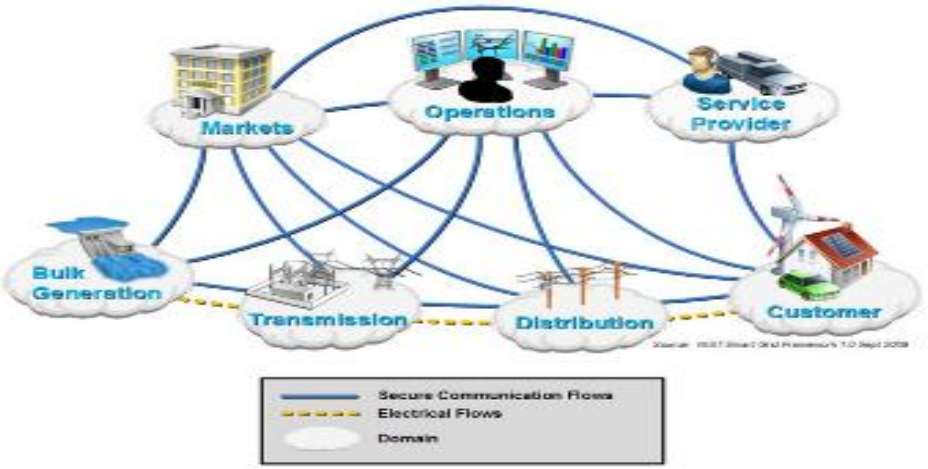
Smart city related projects and examples:

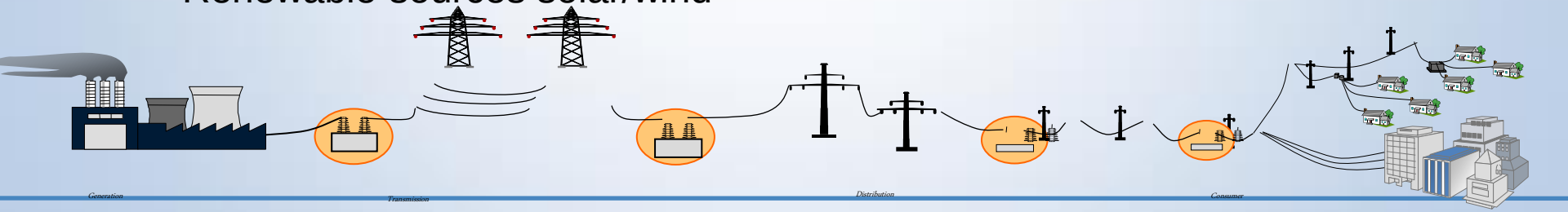
- **eBadge** – Smart grids, international market balancing
- **Finesce** – Smart grids, from producers to costumers
- **VodePRO** – Water levels, modeling and simulation
- **LiaaS** – Modern logistics information platform

Smart Grid

How does it work

- Electrical Grid
- Production==Consumption
- Smart meters
  - Realtime
- Peak curtailment
  - Control devices from centre
  - Run when the price is low (low priority device)
- Sustainability
  - Renewable sources solar/wind





eBadge

International energy management

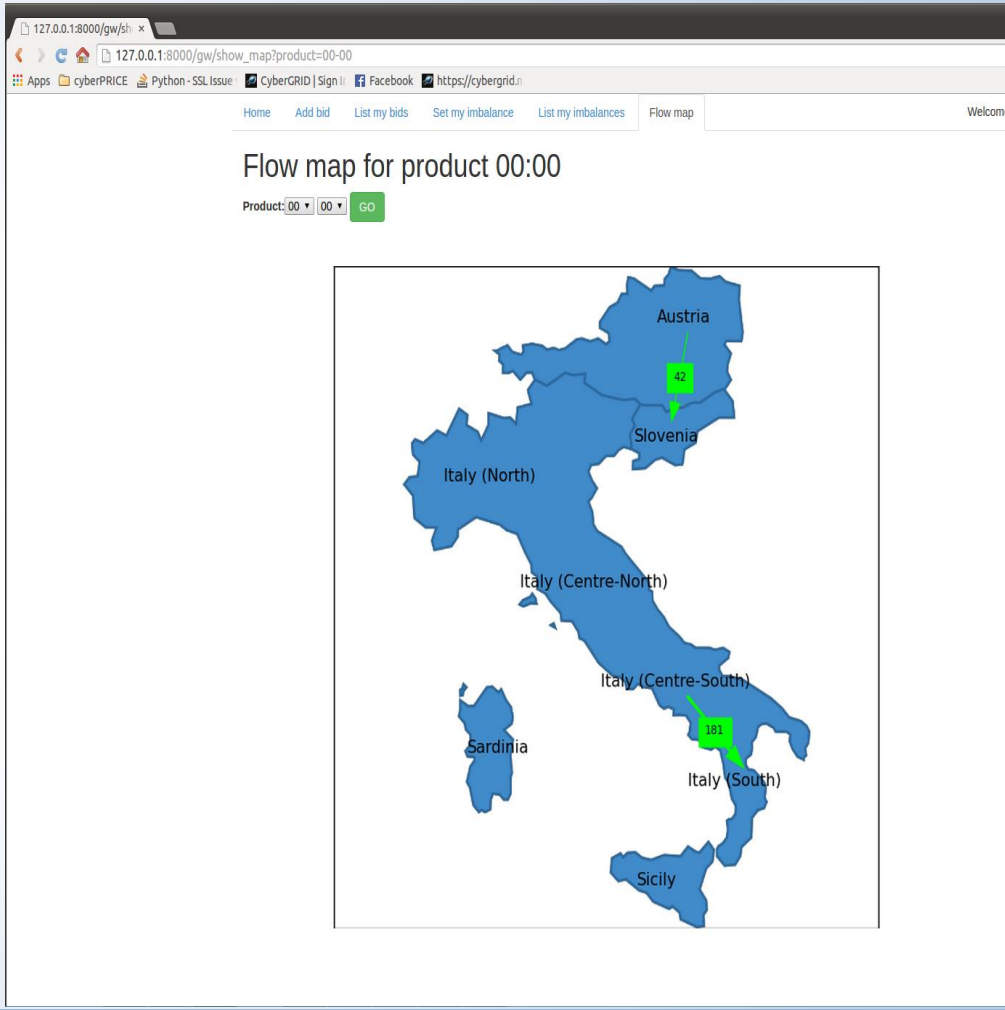
Idea

- Connect International energy consumption markets
- Allow easy management

Key actions

- Collection – smart meters
- Domestic demand response aggregator
- Balance the market
  - Control flows
  - Add bids

eBadge flow map



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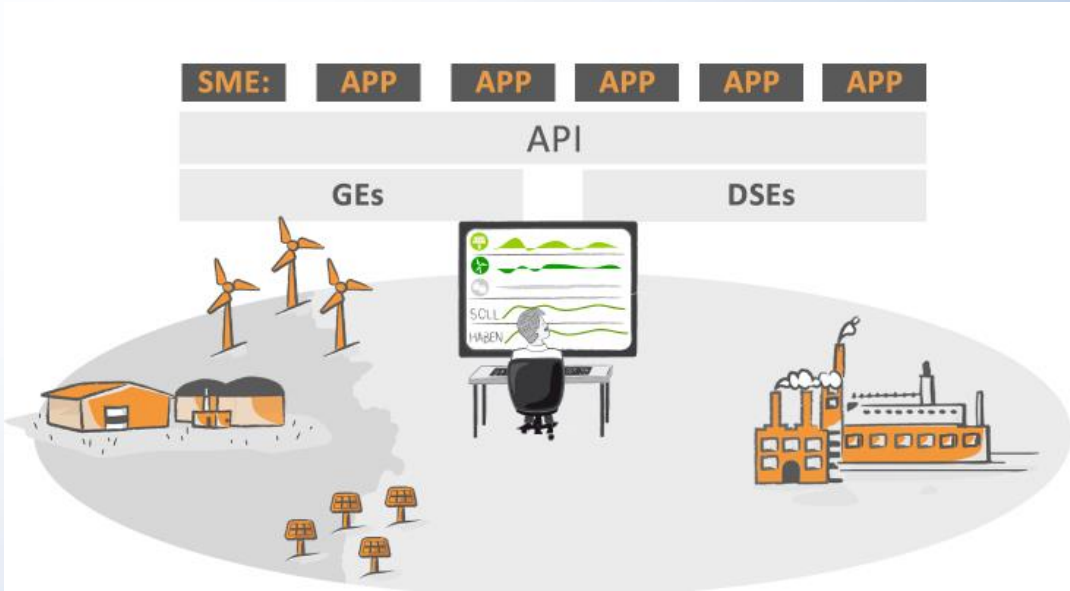
Finesce

Future Internet Smart Utility Services

Apps and aplications for Smart Energy World

- Virtual power plant
  - Energy resource aggregator
- Smart factory
  - Production planning
- Smart home
  - Sensors (on/off)
  - Consumer/prosumer
- Electrical Vehicles
  - Consumers/energy storage
- e-Market place
  - Actions



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Finesce

Resource tracking and energy efficiency estimation

Collecting data for modeling and forecasting

- Tracking dependencies between
  - Weather
  - amount of energy available
  - staff and production costs
  - …
- Simulation of future availability of energy given data forecast (weather)
- What-if analyses

Visualisation - home

Dashboard

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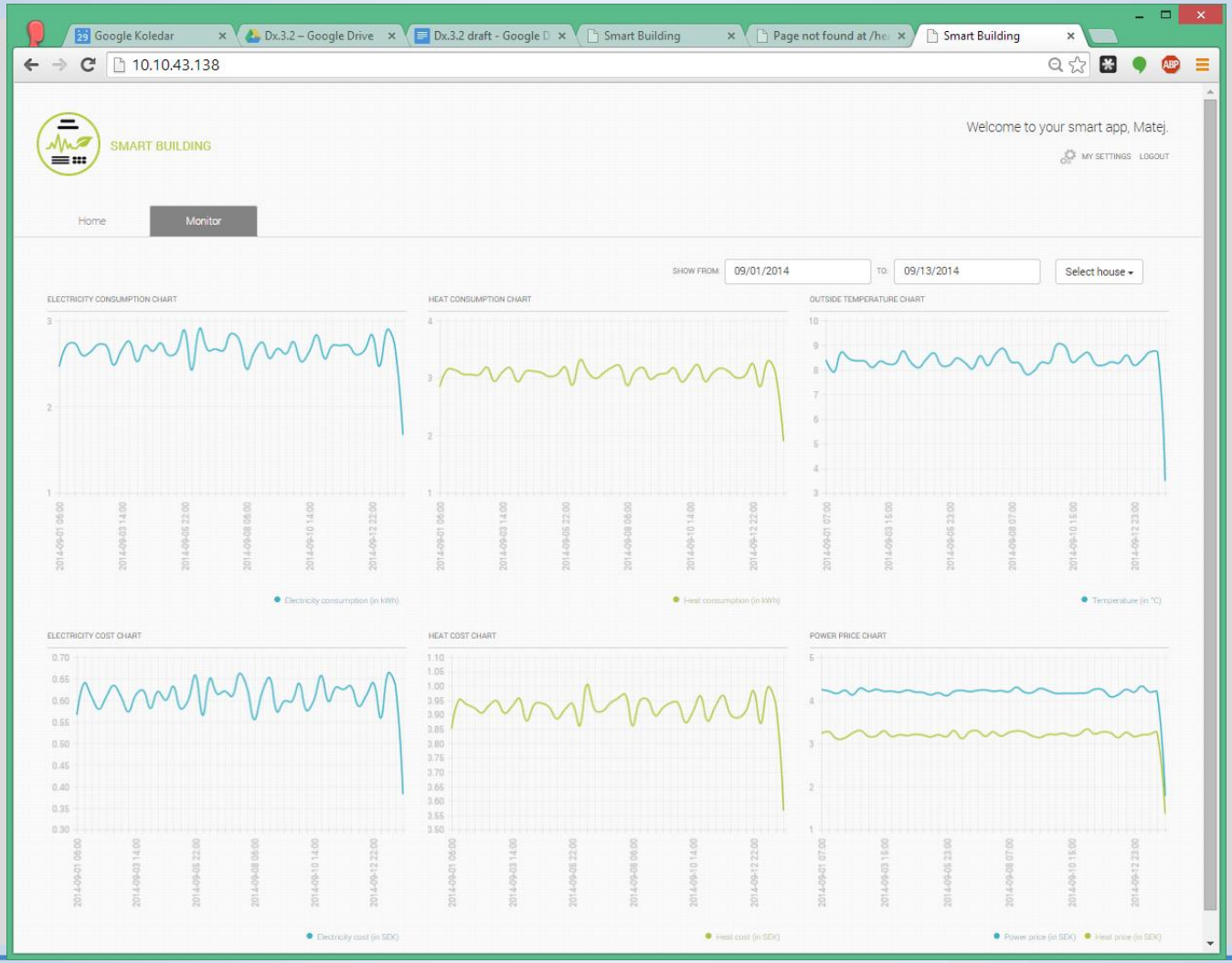
Visualisation - monitor

Dashboard



VodePRO

Water level/discharge regime forcasting

A tool for monitoring, analyse and forecast data of running, surface and underground water levels and discharge regimes

- Final users
  - Researchers
  - Rescue teams for civil protection and disaster relief (floods)
  - Hydroelectric power plants
  - International disaster warning system

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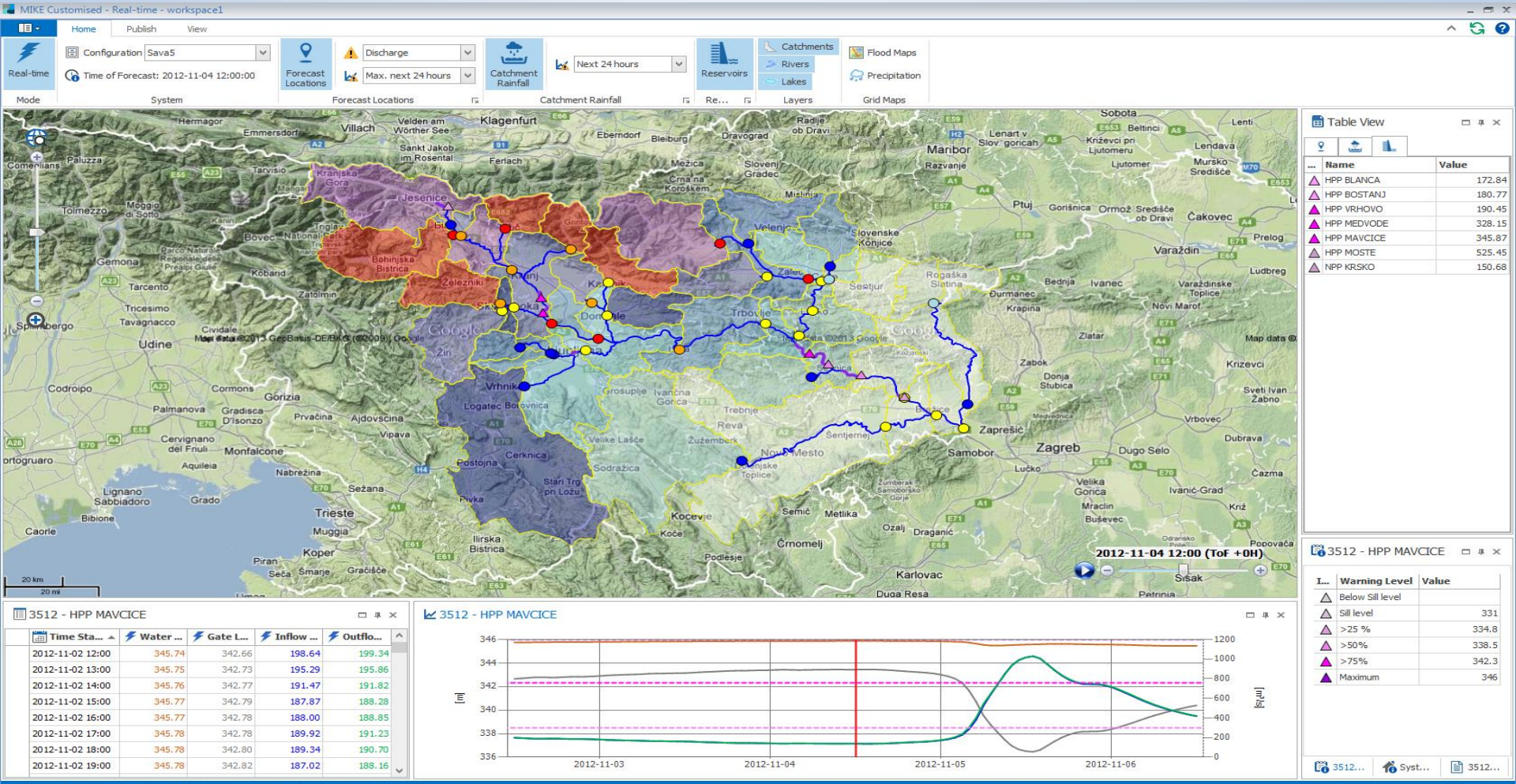
VodePRO

Water level/discharge regime forcasting



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VodePRO

Water level/discharge regime forcasting

Aggregated data

- Meterological
  - Meteorological stations
  - River baisin models
- Hidrological
  - Hydrological stations for underground surface and running waters
- Spatial
  - Flood models and maps of flooded areas, simulations
  - Map layers (geospatial data)

LiaaS
Logistics as a Service

- Logistic as a Service is used for
  - Best route selection
  - Fleet management
  - Cargo logistics optimisation
- Input data (only a few):
  - Traffic entities with GPS devices
  - Organised data bases – planned reconstructions
- Implementation:
  - Desing prediction models, connect with cloud services
- Visualisation:
  - Gaea+

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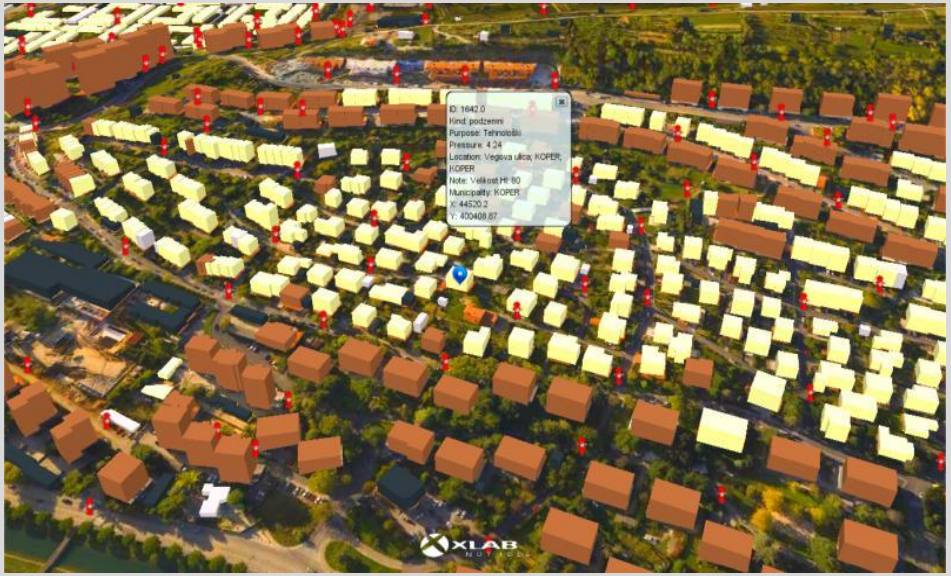
Visualisation

Gaea+ 2D/3D GIS screenshots



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Smart Logistics

What can we use for logistics

- Fleet or route management input (generally)
  - Vehicle tracking
  - Daily/seasonal traffic
  - Weather
- The enrichment of input and combining cloud services
  - Floods (VodePRO)
  - Social event repository
  - User participation – (apps for reporting traffic accidents or other changes)
  - Efficient/economic road lighting (Liaas <-> FINESCE)
  - Energy consumption forecast (*Ferragosto,* Scheduled/planned maintenance in industry, city districts, etc.)

Conclusion

What have we learned

- Smart solutions, cornerstones (from data to service)
- Four examples of smart solutions
- Combining smart solutions – *smart solutions will become smarter*

Thank You

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