Reims tramway

* a lot of data
* idea to better understand what we need in order to have something more concrete to develop the software for workpackage 6
* 1st – platform to collect the data
* 2nd – model different data
* forecast voltage on the line for the next day
  + different substations
  + power meters
  + number of passangers
  + weather
  + extra
* how can we use reims data to develop forecast model
* Miha: we want to use power, not voltage
  + power on a train as one object?
  + or power on a different station?
* Joclyn (Call-in User 3):
  + premature to speak about applications today
  + we start from a dataset that we do not know, we don’t know the quality and physical significance
  + data analytics – exploratory analytics
  + one tramway and one substation
    - Bristol university has already started to work on this data
    - they have IoT data platform
    - what have they already done with this data?
    - based on this we will make further decisions
    - this data will be inpout into evolution energie platform
    - substation transforms AC to DC
    - 1st coordinate with Bristol – they alredy are getting the data
* XYZ (Call-in User 1):
  + the idea is to connect this developed platform to connect it to the Brisatol university platform
  + to use this data and implement in our platform other uses of this data such as forecasting models
  + is it interesting to forecast power, or other power meter
    - next day
    - next year (???)
* Call-in User 3:
  + In2Rail – check the technologies (collection tool)
  + What are the losses
  + How to save energy, correlating consumption with the traffic demand
  + At the moment we don’t have sufficient data … We are only measuring two points in this network.
    - The idea is to measure all substation.
    - We could also register traffic.
  + The next steps:
    - implement measurements in all the substations
    - put accelerometers and GPSs in all the trains
    - starting from this we can build some provisional algorithms and forecasting
    - we don’t yet know the applications
    - we lack the data and the measurements that we would need
* Call-in user 3:
  + static sources: substations
  + moving sources: trains
  + we need correlation between these two sources
  + how to reduce the losses
  + how to reduce peaks
  + forecasting horizons:
    - train – very short time:
      * because the train is moving – one time is a generator, the next time is a consumer (acceleration, breaking!) ☺ important point of energy optimization
      * RECEPTIVITY of the line – percentage of breaking power to be used with other trains
      * internal energy optimization on the line – veliki prihranki
    - more classical long time horizon:
      * same as for the substation
      * (glede na pogodbo; penaltyji za overshooting)
  + power data can be the main concern
    - voltage could be a parameter to monitor – voltage varies a lot in railway systems
  + 1 second granularity on the train
  + Jeff knows about the data – send e-mail (Call-in User 3)
    - send e-mail and they can provide the more detailed explanation
  + Reims: 7 substation
  + In Shift2Rails: we still don’t know – site visit at the end of the month
  + Application not related to energy
    - downgrading components; fault detection; predictive maintenance
    - deterioration of performance over time – change of parameters
  + In Reims they record 5% energy increase every year with the same traffic (!!!)
* Call-in user 3:
  + They can not equip the all the trains. Mostly they can only have GPS and accelerometers.
  + They want to correlate GPS with energy measurements from some trains.
  + Project the system level from GPS to energy domain.
  + In the next steps the new data will be available.
* Miha:
  + Is it possible get schedules, data time tables?
* Call-user 3
  + tramway has similar properties as the bus system – it is not very rigid – depends on drivers, traffic, etc.
* Call user 1
  + CO2 measurements – estimation on the number of passangers – will be available later on with the measurement of all trams (also for the next step)
  + They don’t know any accuracy idea of this measurements