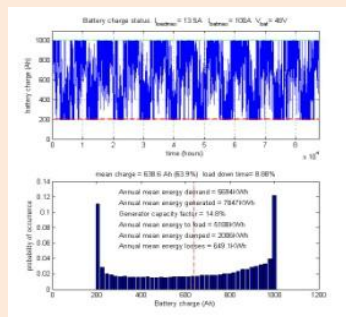


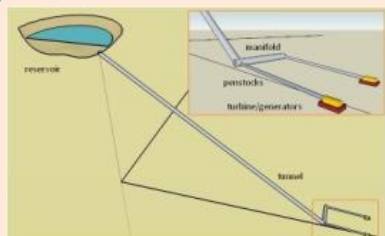
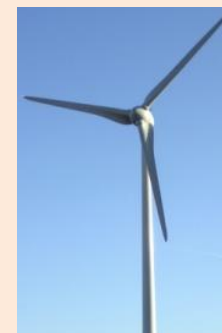
## Packaged simulation services

### Long term performance of off-grid wind generator systems

- Generation of time series of hourly mean wind speeds
- Specific or nominal turbine / generator characteristics
- Generic model of wind generator system
- Output of storage status and load down-time over a 10-year period

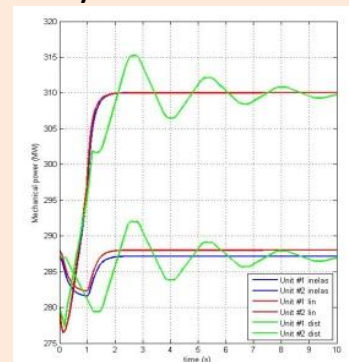


- Assess how much load a specific installation can maintain
- Select the optimum combination of turbine size and storage capacity
- Generate statistics for probability of load cut-out



- Three different models of the hydraulic system, linear and nonlinear
- Linear models of the generator and Grid dynamics
- Design of a basic PID controller
- Integrated model that connects the subsystems

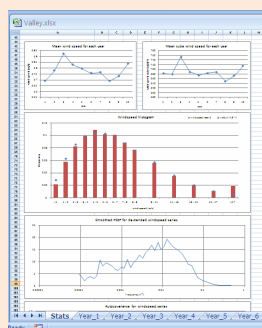
- Acquire a better understanding of the system dynamics
- Assess system trade-offs before committing to procurement and installation
- Anticipate potential control system problems
- Begin systems integration earlier in the project life-cycle



### Hydro-electric system control

### Synthetic wind speed data sets

- Complete 10-year synthetic datasets of hourly wind speeds
- Wide range of European locations
- Compliance with long-term measured statistics published in the European Wind Atlas



- *Installers & Manufacturers:* Perform detailed site assessment as a service to individual customers
- *Training & Education:* Study basic wind turbine power generation
- *Researchers:* Use as an input to renewable energy simulations

