



# System Simulation for new Energy Markets

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Significant changes in world's energy markets come with new challenges for existing and new power plant projects. Conventional disposable units have to be more flexible to balance fluctuations from the renewables.

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## Your challenges

- Make your plant more competitive in changing energy markets
- Enhance range of operation
- Analyse sub-optimal controllers
- Improve control quality

## We can help you

- Check plant failure behaviour
- Check part load behaviour
- Detect bottlenecks
- Evaluate alternatives in planning phase
- Improve performance already in planning phase

## XRG Services

- Modelling & programming
- Simulation & post-processing
- Training
- Subcontracted research projects
- Tailored software solutions

# ClaRa – Simulation of Clausius Rankine Cycles



## Use ClaRa to Analyse Your

- Hard coal power plants - from the coal grinding to the grid
- Combined cycles - catch transients of drum swelling
- Industry power plants - always on demand of your process
- District heating systems - track critical pressure oscillations
- and much more ...



## Powerful for Power Plant Simulation

- Models for the complete equipment: pumps, fans, turbines, heat exchangers, furnace, electric motors, mills, valves, piping and fittings, storage tanks and flue gas cleaning
- Transparent set of equations, well documented
- Robust, fast and user-friendly
- Validated against literature data and measurement data of existing plants



## User-Friendly, Robust and Flexible

- Based on Modelica - a mighty player in system simulations
- Well tested with DYMOLA 2014 and above
- Free of charge and open source
- Easy to extend using the Modelica standard
- Get contact to the developers for tailored models

ClaRa was developed in the research project DYNCAP.  
Project Partners:



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