ITN ENERGY-SMARTOPS WORKSHOP "Optimization to provide energy savings by better integration of operations across the process-mechanical-electrical interfaces", LADENBURG, GERMANY, 22-24 Oct 2013.



# **Energy-SmartOps**

Integrated Control and Operation of Process, Rotating Machinery and Electrical Equipment

# Visualization of connectivity - Project Overview (ESR-H)

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#### Introduction

#### Current problem

Finding the root cause to a problem in chemical facilities requires collaborative efforts of domain experts who need to investigate, compare and read data from different sources. In large-scale complex systems this is a daunting, time-consuming task.



# Research objectives

We aim to define new concepts for the representation of plant and equipment connectivity that can be used by these domain experts from mechanical, process, and electrical disciplines.

## Goals

## Support users in cause and effect discovery by:

- reducing interfaces between engineering tools
- improving the way information is presented
- using information-rich data visualization

**Reduce time** and empirical knowledge required for performing connectivity analysis

Achieve more efficient collaboration between users

## Motivation



### Costumer challenges

- Data overload
- Increase of complexity
- Organizational changes brain drain



## Technology trends

- Big data
- Use of semantic ontologies
- Integrated operations IO



## Energy efficiency

- Smart is the new green
- Better use of installed assets EU Plan

#### Imperial College London

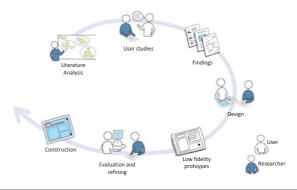




# Methodology

#### **User Centered Design**

User-centered design (UCD) as a design methodology to make sure that the needs, wants, and limitations of end users are given extensive attention at each stage.



# **Progress**

#### Main results

- User studies (interviews and site-visits at Statoil)
- · Selection and prioritization of use-cases
- Review of data-exchange standards for plant data (IEC, ISO)
- Low- and medium fidelity prototypes from visualization environment
- Novel visualization concepts for process graph networks



## Future work

## XML modelling of test facilities

