The impact of FMI on In-house Tool Development
Bright Prospects for OpenModelica?
Agenda

1. High demand on dynamic simulation tools due to market needs.
2. FMI
3. Exemplary usage of FMI in DYNAPLANT
4. Major OpenModelica improvements needed
5. Conclusion
FMI: Motivation and Background
Functional Mock-up Interface (FMI) - Motivation (1)

Problems / Needs
- Component development by supplier
- Integration by OEM
- Many different simulation tools

Solution
- Reuse of supplier models by OEM:
  - DLL (model import) and/or
  - Tool coupling (co-simulation)
- Protection of model IP of supplier

Added Value
- Early validation of design
- Increased process efficiency and quality

slide from Nick Suyam, Daimler (adapted)
FMI — Overview

The FMI development is part of the ITEA2 MODELISAR project (2008 - 2011; 29 partners, Budget: 30 Mill. €)

- FMI development initiated, organized and headed by Daimler AG
- Improved Software/Model/Hardware-in-the-Loop Simulation, of physical models from different vendors.
- Open Standard
- 14 Automotive Use-Cases to evaluate FMI.

![Functional Mockup Interface](image_url)

etc.

Modelica 2011: Functional Mockup Interface  Slide 6
FMI - Main Design Idea (1)

- FMI for Model Exchange:
  - Version 1.0 released in January 2010

- FMI for Co-Simulation:
  - Reuses as much as possible from FMI for Model Exchange standard
  - Version 1.0 released in October 2010
FMI as a basis for tests

FMI test scenarios

- test FMUs of different tools regarding:
  - Performance.
  - Modelica compliance.
  - Accuracy.
- Run automated tests on compiled models.
- Combine different FMUs with different solvers and runtimes.
- Use your own proven solver and runtime.
Potential industrial OpenModelica Use Cases
FMI Workflow for in-house plant modeling

I&C System: SPPA-T3000

Semi automatic generation of FMUs

Dynamic simulation In-house tool DYNAPLANT II

Transfer data from HFDs

Steady state HFD: KRAWAL

Plant Start-up

For internal use only!

Energy F ES EN PTEC PE
Manual generation of FMUs
Ideal Workflow for in-house plant modeling

Generate FMUs based on arbitrary Modelica code on the fly.
Conclusion

- The demand on specific modeling solutions will increase dramatically not only in the energy business.
- FMI simplifies the integration of Modelica in in-house tools.
- Open source Modelica environments are highly attractive for the utilization in in-house tools.
- The potential for industrial funding (e.g. OSMC level 2 membership) is huge, but might be even larger if:
  - the development has a stronger application focus.
  - better communication of achievements and short comings.
- Powerful interfaces and scripting are key features.
Your Feedback

Thank you for your attention!