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Open-Source as a strategy for operational software – the case of Enki

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Since 2002, SINTEF Energy has been developing what is now known as the Enki modelling system. This development has been financed by Norway's largest hydropower producer Statkraft, motivated by a desire for distributed hydrological models in operational use. As the owner of the source code, Statkraft has recently decided on Open Source as a strategy for further development, and for migration from an R&D context to operational use. A current cooperation project is currently carried out between SINTEF Energy, 7 large Norwegian hydropower producers including Statkraft, three universities and one software company.

Of course, the most immediate task is that of software maturing. A more important challenge, however, is one of gaining experience within the operational hydropower industry. A transition from lumped to distributed models is likely to also require revision of measurement program, calibration strategy, use of GIS and modern data sources like weather radar and satellite imagery. On the other hand, map based visualisations enable a richer information exchange between hydrologic forecasters and power market traders. The operating context of a distributed hydrology model within hydropower planning is far from settled.

Being both a modelling framework and a library of plugin-routines to build models from, Enki supports the flexibility needed in this situation. Recent development has separated the core from the user interface, paving the way for a scripting API, cross-platform compilation, and front-end programs serving different degrees of flexibility, robustness and security. The open source strategy invites anyone to use Enki and to develop and contribute new modules. Once tested, the same modules are available for the operational versions of the program. A core challenge is to offer rigid testing procedures and mechanisms to reject routines in an operational setting, without limiting the experimentation with new modules.

The Open Source strategy also has implications for building and maintaining competence around the source code and the advanced hydrological and statistical routines in Enki. Originally developed by hydrologists, the Enki code is now approaching a state where maintenance requires a background in professional software development. Without the advantage of proprietary source code, both hydrologic improvements and software maintenance depend on donations or development support on a case-to-case basis, a situation well known within the open source community. It remains to see whether these mechanisms suffice to keep Enki at the maintenance level required by the hydropower sector.

ENKI is available from www.opensource-enki.org.