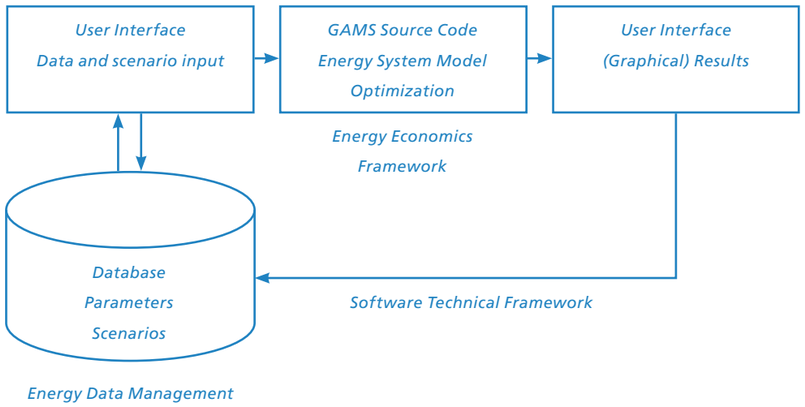
Reservoirs of the Nant de Drance pumped-storage power station. With an output of 900 MW, it will generate around 2.5 billion kWh of electricity per year when it commences operation at the end of 2018.
© Michel Martinez, 2012

Basel refuse incineration plant at night
© Simon Havlik, 2005

Integrated Resource Planning (IRP)

Energy companies want to generate electricity efficiently, while it is in customers' interest to use as little electricity as possible. However, for many years this reduced the revenue and profits of energy producers. A resource-efficient energy management system can resolve this conflict of interest. Instead of selling kilowatt hours, providers sell a specific energy service. Revenue and profit are no longer measured solely in terms of electricity sales and it is now worthwhile for energy providers to promote energy-saving measures.

software architecture of the IWB energy system model



From municipal energy supplier to resource-efficient energy manager

Basel's municipal utility IWB is working to become an energy management provider with support from Leipzig Fraunhofer Center researchers. In so doing, it is responding to the liberalization of the Swiss energy market. From 2018, Swiss customers will be free to select a provider of their choice on the European energy market.

With a view to securing its position on the energy market in the Basel region, IWB intends to work with its customers in future to optimize its energy supply and become a modern energy services provider. The business models to be analyzed should include all energy sources (electricity, heat, biogas and natural gas). Leipzig Fraunhofer Center researchers from the Energy Management and Energy Economics Unit and experts from Leipzig University are providing specialist support for the implementation process.

Simulating customer-side measures

The interdisciplinary team first developed the IRPsim simulation model, which simulates Basel's energy supply and demand structure for the next 20 years. This software allows IWB to plan for the medium term and select the most cost-effective energy measure - for example, when deciding whether or not to introduce variable electricity tariffs.

Answers to strategic questions

The simulation will also provide answers to strategic questions in future – questions such as: which customer groups are particularly attractive to competitors and how can IWB secure the loyalty of these groups in the long term? At the same time, IWB is seeking to blaze fresh trails in its model development. For example, it is planning to integrate the decision-making behavior of its customers into the software. It is making use of the Big Data Center at Leipzig Fraunhofer Center to process and analyse its corporate and customer data.

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Duration: 2014 – 2018

Client: IWB, Basel

Supported by: Institute of applied Informatics (InfAI), University of Leipzig

"In Leipzig Fraunhofer Center, we have a project partner that stands out from other providers thanks to the breadth of its energy industry expertise. Its previous results have convinced us on all counts. The team of researchers at the Leipzig Fraunhofer Center is able to take into account additional aspects relating to market development and consumer behavior."

Patrick Wellnitz, Head of Energy Solutions, Development