Interactive Collaboration and Dissemination Tools

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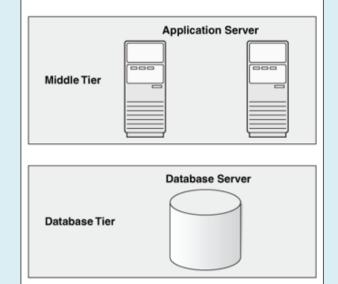Volker Krey (Energy Program, IIASA)

The Challenge

Data-sharing and communication are essential elements of any kind of scientific work, especially for model inter-comparison projects. In the recent past, the integrated assessment modeling community has grown significantly, and so too have its requirements for exchanging model output and assumptions. Data management has thus become a serious challenge in these modeling inter-comparison projects.

Under the umbrella of the Integrated Assessment Modeling Consortium (IAMC), in the formation of which IIASA was instrumental, innovative software solutions have been developed jointly by the Transitions to New Technologies (TNT) and Energy (ENE) programs at IIASA and are now playing an important role in streamlining this process.

A related challenge is the documentation and dissemination of study results from modeling inter-comparison projects as well as from other scenario based assessments.
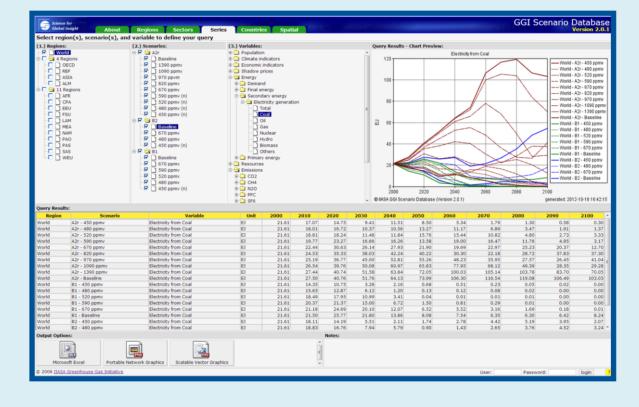
Our Vision

As part of a task group of the IAMC, we wanted to help the integrated assessment modeling community spend more time on analysis of scenario data and less on managing data.

- To develop data exchange tools that serve as a self–service, one–stop shop for the majority of user needs.
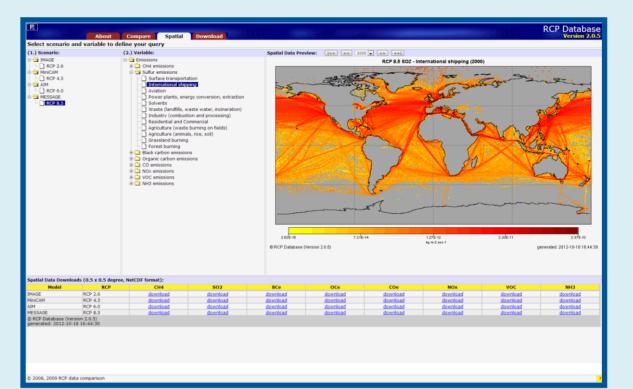- To create a "flexible data exchange standard" – one that is machine-readable and automated
- To initialize a standard syntax for data reporting within the integrated assessment community
- To aid modelers in checking the quality of their large data sets with the help of largely automated, rule-based consistency checks.
- With their easy-to-use visualization capabilities the web-databases also serve as an important dissemination channel for scenario data.

Where are we today ?

Since our first software tool went online in 2006 (IIASA's Greenhouse Gas Initiative (GGI) Scenario Database), TNT and ENE scientists have developed a number of web-based solutions for various applications, including a significant number of model inter-comparison projects:

- Global Energy Assessment (GEA)
- Representative Concentration Pathways (RCPs)
- Shared Socio-economic Pathways (SSPs)
- IPCC Working Group III 5th Assessment Report (AR5)
- Energy Modeling Forum exercises (EMF24, EMF27, EMF28)
- Asian Modeling Exercise (AME)
- AMPERE (EU-FP7 project)
- LIMITS (EU-FP7 project)
- Latin American Modeling Project (LAMP)

How does it work ?

The IIASA Collaboration and Dissemination Tools are based on a 3 tier software architecture. Data is stored in a (ORACLE) database, application logic being executed on a JAVA servlet engine (Tomcat), and the user interface is rendered by a web browser (e.g. Internet Explorer or Firefox). The user interface shows data in line, area, and scatter plots as well as in table formats and provides MS Excel ® formatted downloads.

Let's meet online …

During the study phase modeling comparison projects are closed community by nature. But as soon as the books are getting closed, study results will become available online. Please visit the web-sites below to find out more.

http://www.iiasa.ac.at/web-apps/ggi/GgiDb

The **GGI** (Greenhouse Gas Initiative) **scenario database** documents the results of a set of greenhouse gas emission scenarios that were created using the IIASA Integrated Assessment Modeling Framework and previously documented in a special issue of Technological Forecasting and Social Change.
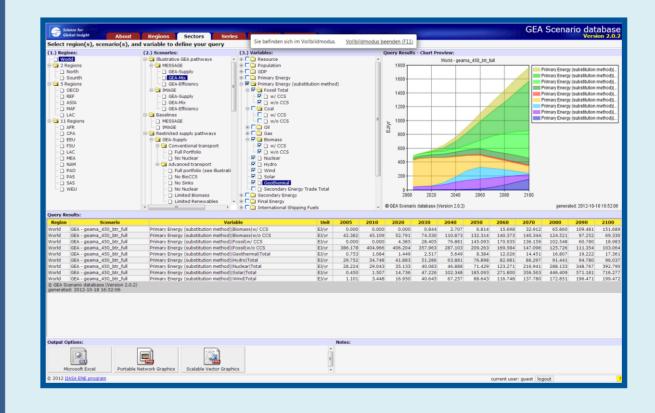
http://www.iiasa.ac.at/web-apps/tnt/RcpDb

The **RCP database** shows emissions, concentrations, and land-cover change projections of the so-called "Representative Concentration Pathways" (RCPs). The RCPs are meant to serve as input for climate and atmospheric chemistry modeling as part of the preparatory phase for the development of new scenarios for the IPCC's Fifth Assessment Report and beyond.

http://www.iiasa.ac.at/web-apps/ene/geadb

The **GEA scenario database** documents results and assumptions of the Global Energy Assessment (GEA) transformation pathways. GEA comprises a single normative scenario in which alternative pathways describe transformations towards sustainable energy systems. For example, the pathways all stabilize future global mean temperature increase to 2°C above preindustrial levels, and they all lead to (almost) universal access to energy services throughout the world by 2030. The database serves as a central data-repository for the dissemination of GEA Chapter 17 scenario information.

Acknowledgements