

Overview

LEAP[®], the Long range Energy Alternatives Planning System, is a powerful, widely used software tool for energy policy analysis and climate change mitigation assessment developed in SEI's U.S. Center.

LEAP has been adopted by thousands of organizations in more than 190 countries worldwide, including government agencies, academics, non-governmental organizations, consulting companies and



energy utilities. It can be used at a wide range of scales, from cities and states to national, regional and even global applications. LEAP is fast becoming the *de facto* standard for countries undertaking integrated resource planning and greenhouse gas mitigation assessments, especially in the developing world.

LEAP and its associated training materials and documentation are available free of charge to qualified academic, governmental and not-for-profit organizations based in the developing world and to students worldwide. Consulting companies, utilities and other businesses can access LEAP through affordable licensing arrangements.

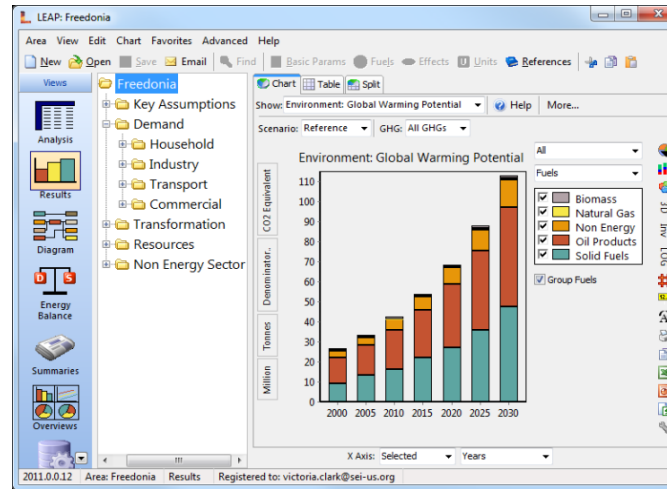
LEAP is distributed and supported through SEI's COMMEND program, an online initiative to foster a community among developing country energy analysts.

Integrated planning

LEAP is an integrated modelling tool that is used to track energy consumption, production and resource extraction in all sectors of an economy. It can be used to account for both energy sector and non-energy sector greenhouse gas (GHG) emission sources and sinks. In addition to tracking GHGs, LEAP can also be used to analyse emissions of local and regional air pollutants, making it well-suited to studies of the climate co-benefits of local air pollution reduction.

Decision support system

LEAP is more than just a model: it is a full decision support system providing extensive data management and reporting capabilities. It can serve as both a historical database showing the evolution of an energy system and a forward-looking, scenario-based tool. LEAP provides powerful data



management tools, including full importing and exporting to Microsoft Excel, Word and PowerPoint, and a rich graphical environment for visualising data and results.

LEAP presents complex energy analysis concepts in a transparent and intuitive way. It is flexible enough for use by users with a wide range of expertise: from leading global experts who wish to design policies and demonstrate their benefits to decision-makers, to trainers who want to build capacity among young analysts who are learning to understand the complexity of energy systems.

Modelling methodologies

LEAP is not a model of a particular energy system, but rather a tool that can be used to create models of different energy systems, where each requires its own unique data structures. It supports a wide range of modelling methodologies on both the demand side (from bottom-up, end-use accounting, to top-down macroeconomic modelling, to stock-turnover), and on the supply side (for example, capacity expansion planning). LEAP provides powerful modelling capabilities, but is also flexible and transparent enough to easily incorporate data and results from more specialized models.

LEAP's modelling capabilities operate at two basic conceptual levels. At the first level, LEAP's built-in calculations handle 'non-controversial' energy, emissions and cost-benefit accounting. At the second level, users can enter specific time-varying data or create a wide variety of sophisticated multi-variable models.

Time frame

LEAP is intended as a medium to long-term modelling tool. Most of its calculations occur at yearly intervals, but can be extended for an unlimited number of years. Most studies use a forecast period of between 20 and 50 years. It is also possible to split a year into different user-defined "time slices" to represent seasons, types of days or even representative times of the day. Studies typically include both a historical period, in which the model is run to test its ability to replicate known statistical data, as well as multiple forward looking scenarios.

Scenario analysis

Using LEAP, policy analysts can create and then evaluate alternative scenarios by comparing their energy requirements, their social costs and benefits, and their environmental impacts. Policymakers can use LEAP to assess the marginal impact of an individual policy as well as the interactions that occur when multiple policies and measures are combined.

Low initial data requirements

As LEAP relies on simple accounting principles, and because many aspects of LEAP are optional, its initial data requirements are relatively low. This means that users can rapidly create a simple initial analysis, before adding complexity when data is available and where the added detail provides further useful insights into the issue. In this way energy and environmental forecasts can be prepared before any cost data have been entered.

National starter data sets

SEI is now offering national-level 'starter' data sets for LEAP, which combine historical energy balance data provided by the International Energy Agency with data from other sources, e.g. emission factors from the Intergovernmental Panel on Climate Change, population projections from the United Nations, development indicators from the World Bank, non-energy sector GHG sources and sinks from the World Resources Institute and energy resource data from the World Energy Council. It should be noted that these data sets are not meant to provide forecasts, but to provide a starting point for analysts to develop their own more detailed analyses. As of November 2011, 23 have data sets for over 100 countries.



What's new in LEAP2011?

LEAP2011 adds major new features including least-cost optimization capabilities, improved modelling of seasonal and time-of-day variations in energy demand and supply and a new file format. It also includes an improved user interface that makes it easier to enter and select data.

New features in LEAP2011 include least-cost optimization calculations; improved modelling of seasonal and time-of-day variations in demand and supply; several new and improved data entry tools; improved cost analysis; an improved Scenario Manager; and full support for multiple languages and character sets. A detailed list of new features is available on our website.

COMMEND and LEAP training

COMMEND (COMMunity for ENergy environment & Development) is an international initiative designed to foster a community among energy analysts working on energy for sustainable development. It is managed by SEI-US with Fundación Bariloche in Argentina, ETC International in the Netherlands, ENDA-TM in Senegal, and the Energy Research Centre in South Africa (ERC).

COMMEND provides a forum for communication and collaboration for analysts around the world. Its website, www.energycommunity.org, includes discussion forums, extensive LEAP materials, and a wealth of related resources.

In addition, SEI-US and COMMEND sponsor regional training workshops on LEAP for researchers across the global South, and provide online support as well.

Policy impacts

LEAP is helping to shape energy and environmental policies worldwide, both directly, through government-sponsored applications, and through independent studies. Dozens of countries have used LEAP to prepare greenhouse gas mitigation assessments as part of their national communications to the United Nations Framework Convention on Climate Change (UNFCCC), and many are using LEAP to guide their domestic policy-making.

Recent applications include:

- Lebanon's Second National Communication (2011);
- *Getting to Zero: A Pathway to a Carbon Neutral Seattle* (2011), an SEI study commissioned by the City of Seattle;
- Scenarios for implementation of the Massachusetts Global Warming Solutions Act (2009), which requires emission reductions of 10-25% below 1990 by 2020, 80% by 2050;
- *Europe's Share of the Climate Challenge: Domestic Actions and International Obligations to Protect the Planet* (2009), an SEI report on how to achieve GHG emissions reductions of 40% in 2020 and 90% by 2050 (vs. 1990 levels);
- *Economics of Climate Change: Towards a Low-Carbon Economy in China*, a major collaboration between SEI and the China Economists 50 Forum (2009; book issued 2011);
- *México: Estudio sobre la Disminución de Emisiones de Carbono* (2009), a World Bank-sponsored study to support the implementation of a long-term climate change agenda.

For More Information

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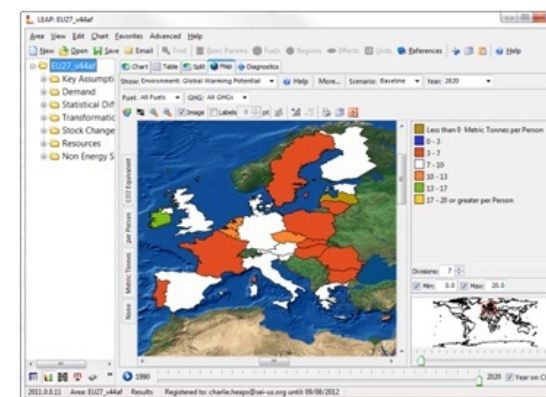
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Long range Energy Alternatives Planning System

A tool for energy policy analysis and climate change mitigation assessment



LEAP2011 released in May 2011



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SEI-US is an independent research affiliate of Tufts University