



**The Abdus Salam
International Centre for Theoretical Physics**



2242-2

**Joint ICTP-IAEA Workshop on Uncovering Sustainable Development
CLEWS; Modelling Climate, Land-use, Energy and Water (CLEW)
Interactions**

30 May - 3 June, 2011

Introduction to related activities in IAEA - PESS

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**Joint ICTP-IAEA Workshop on
Uncovering Sustainable Development CLEWS:
Modelling Climate, Land-use, Energy and Water
(CLEW) Interactions**

***Selected related IAEA-PESS
[Planning and Economic Studies Section]
Activities***

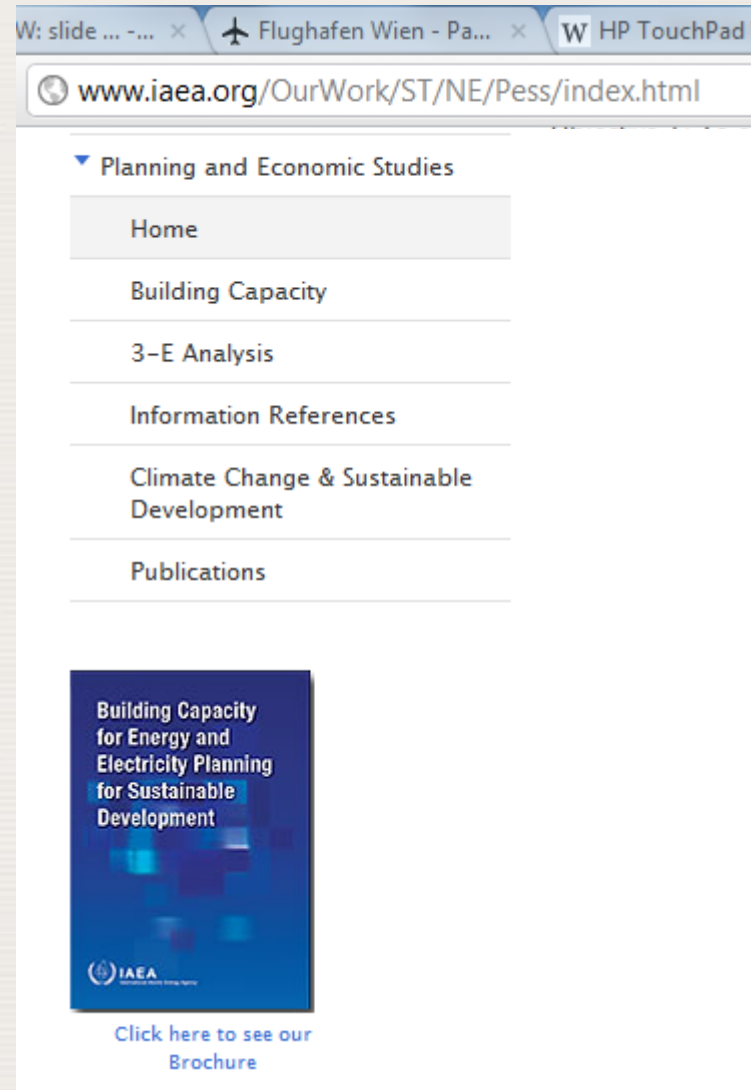
**Mark Howells
IAEA, Nuclear Energy Department
Planning and Economic Studies Section**



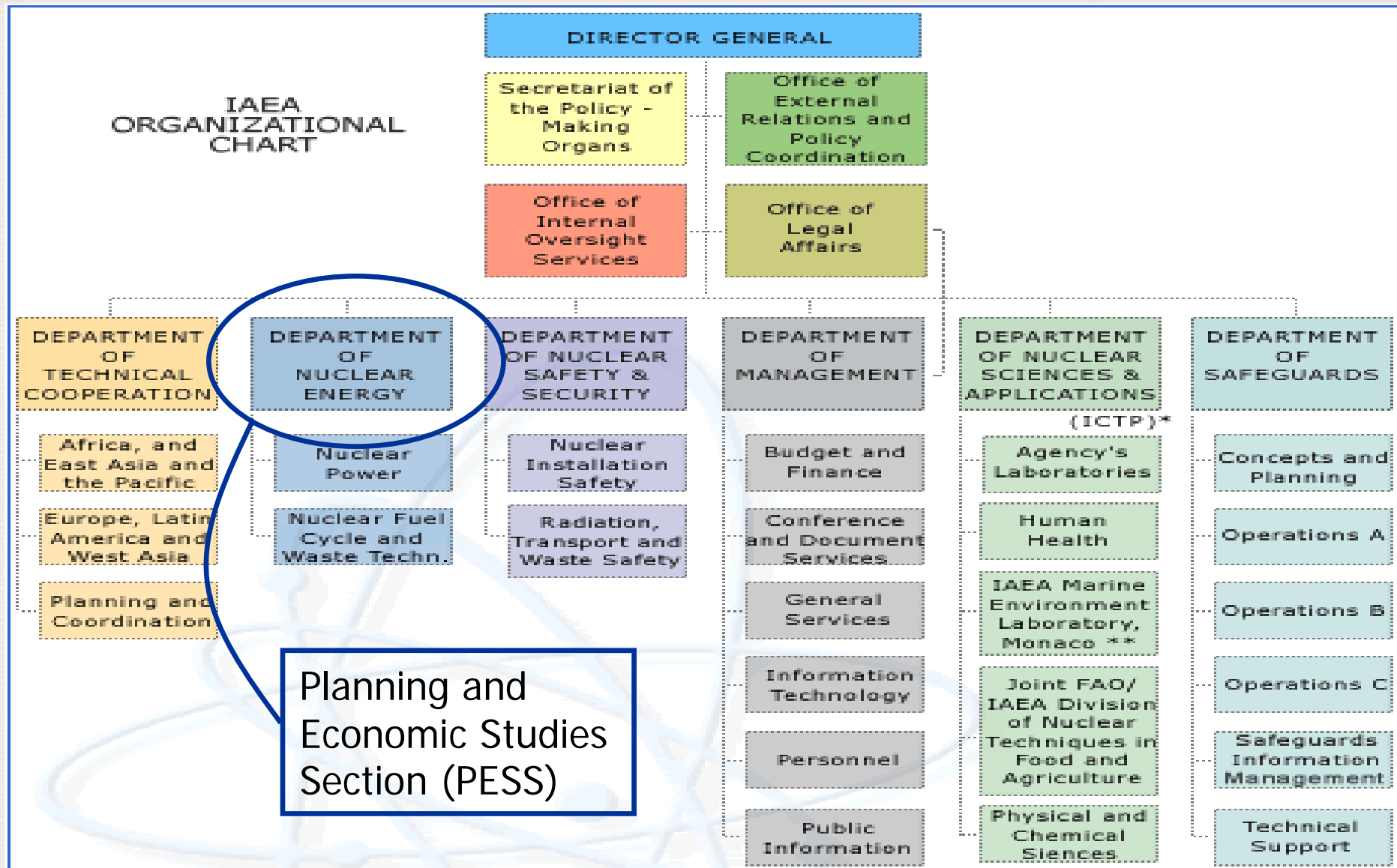
Our website ...

<http://www.iaea.org/OurWork/ST/NE/Pess/index.html>

- Information
- Reports
- Statistics
- Presentations
- And more
- Etc..



Structure of the IAEA



Mission

The IAEA, through its Planning and Economic Studies Section, assists Member States to build their capacity

- to perform analysis for developing alternative strategies for sustainable energy development,
- to evaluate related energy-economic-environmental implications, and
- to assess the potential contribution of nuclear energy in securing affordable and clean supplies of energy

Energy modelling & capacity building

- Develop and transfer planning tools tailored to circumstances in developing countries
- Train local experts
- Jointly analyze national options and interpret results
- Help establish institutional set up for continued local planning activities
- Assist in studies done by countries

Energy choices

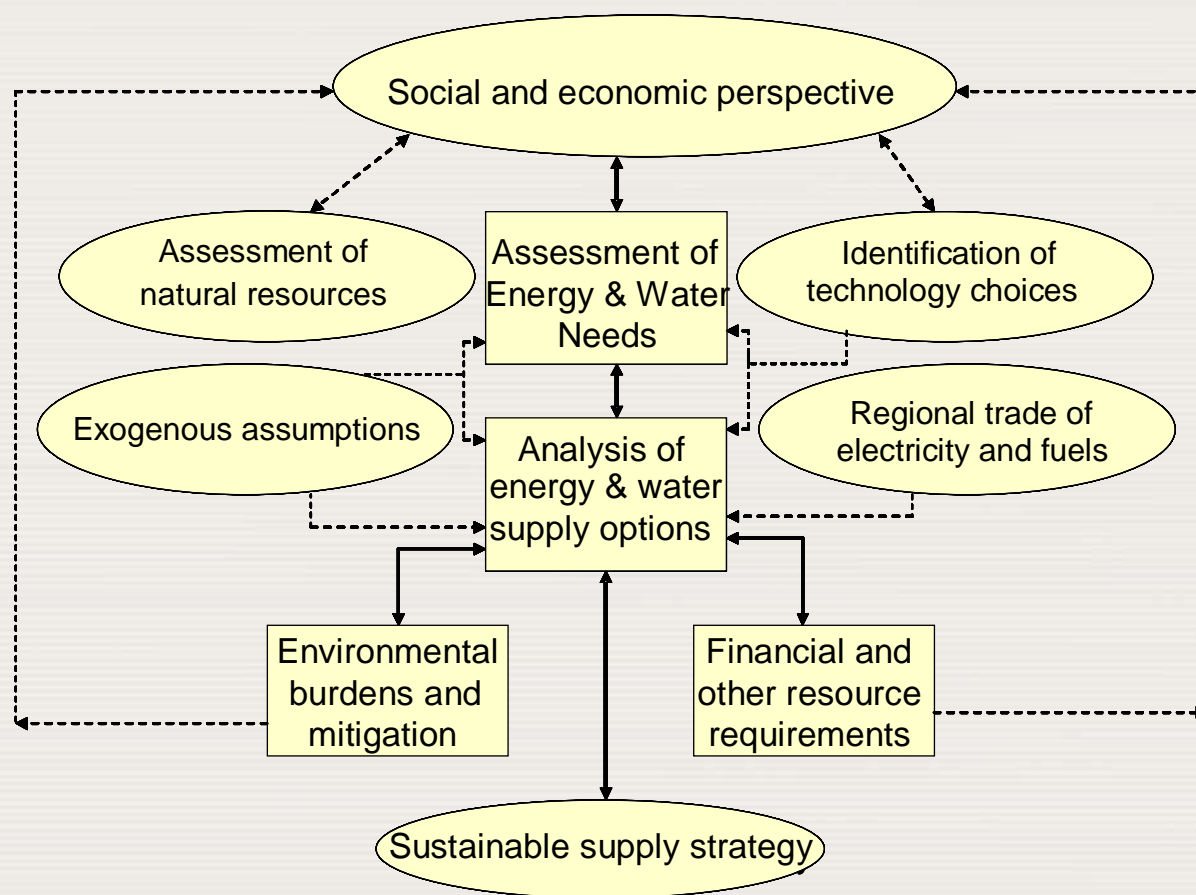


IAEA energy analysis tools

- **M**odel for the **A**nalysis of **E**nergy **D**emand
- **W**ien **A**utomatic **S**ystem **P**lanning Package
- **M**odel for **E**nergy **S**upply **S**ystem **A**lternatives and their **G**eneral **E**nvironmental impacts
- **F**inancial Analysis of Electric Sector Expansion **P**lans
- **S**implified Approach for Estimating **I**mpacts of Electricity Generation
- **E**nergy **I**ndicators for **S**ustainable **D**evelopment



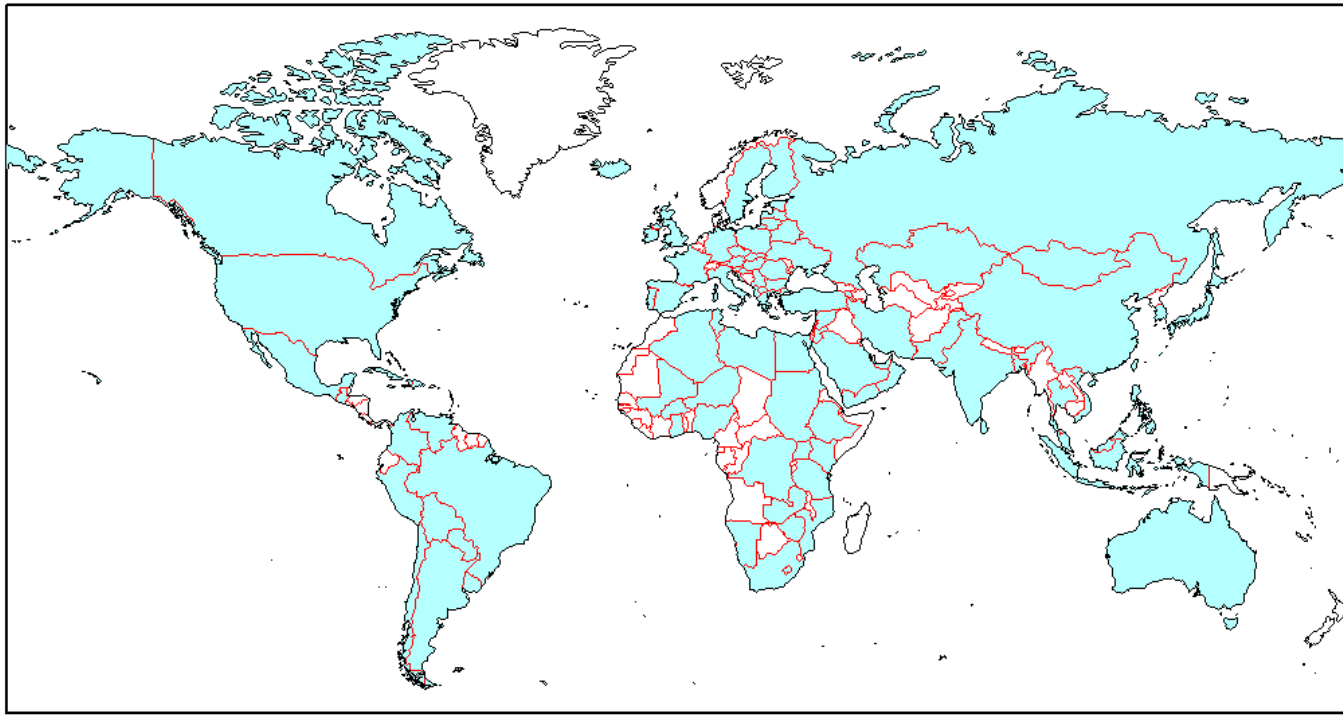
Analytical framework



Examples of analysis

- Electricity expansion
- Energy expansion
- Technology appraisal
- Policy appraisal
- GHG Mitigation
- Geopolitical considerations
- Multi-resource analysis
- Etc..

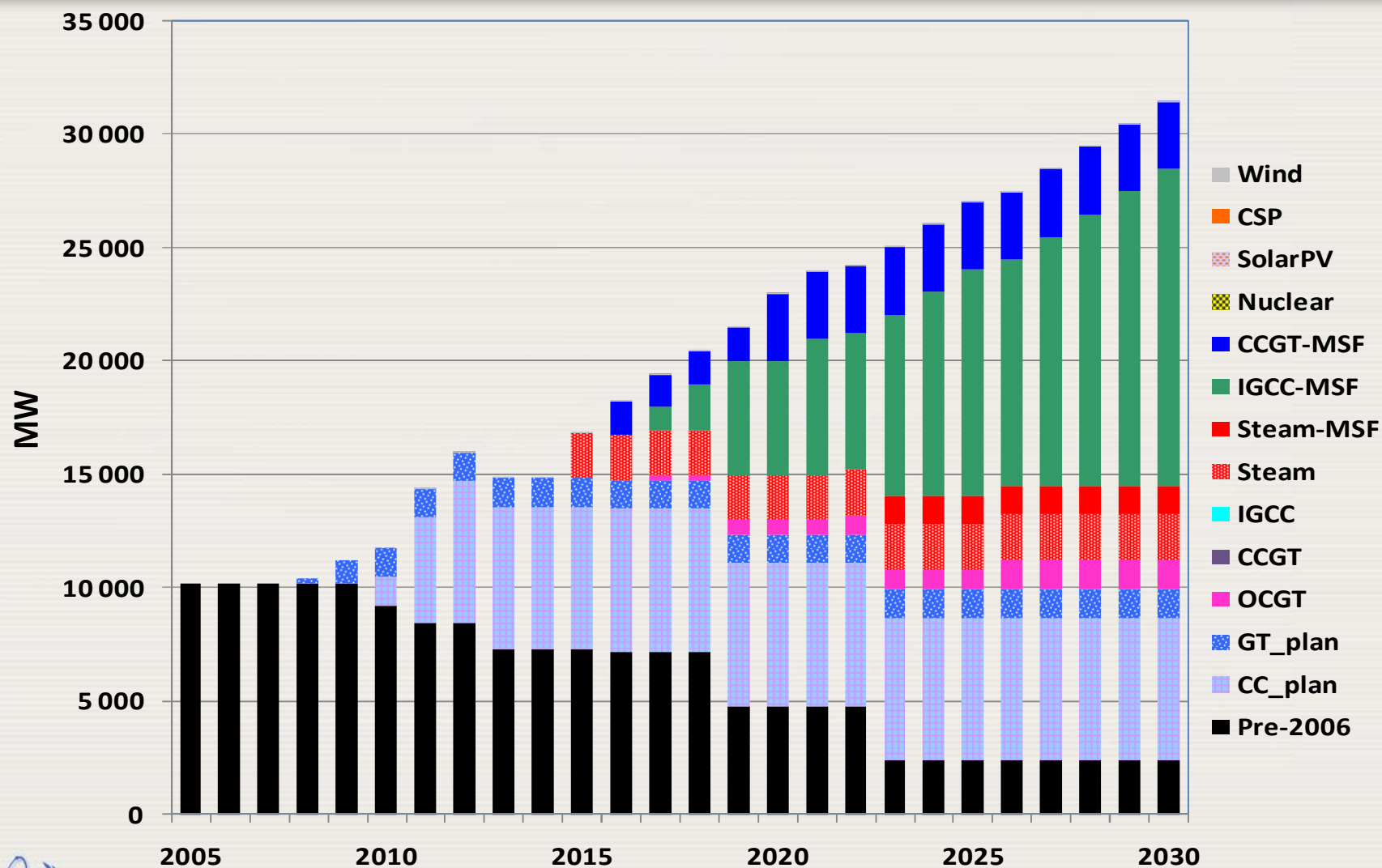
Energy Models Dissemination



120 countries (majority regular users)

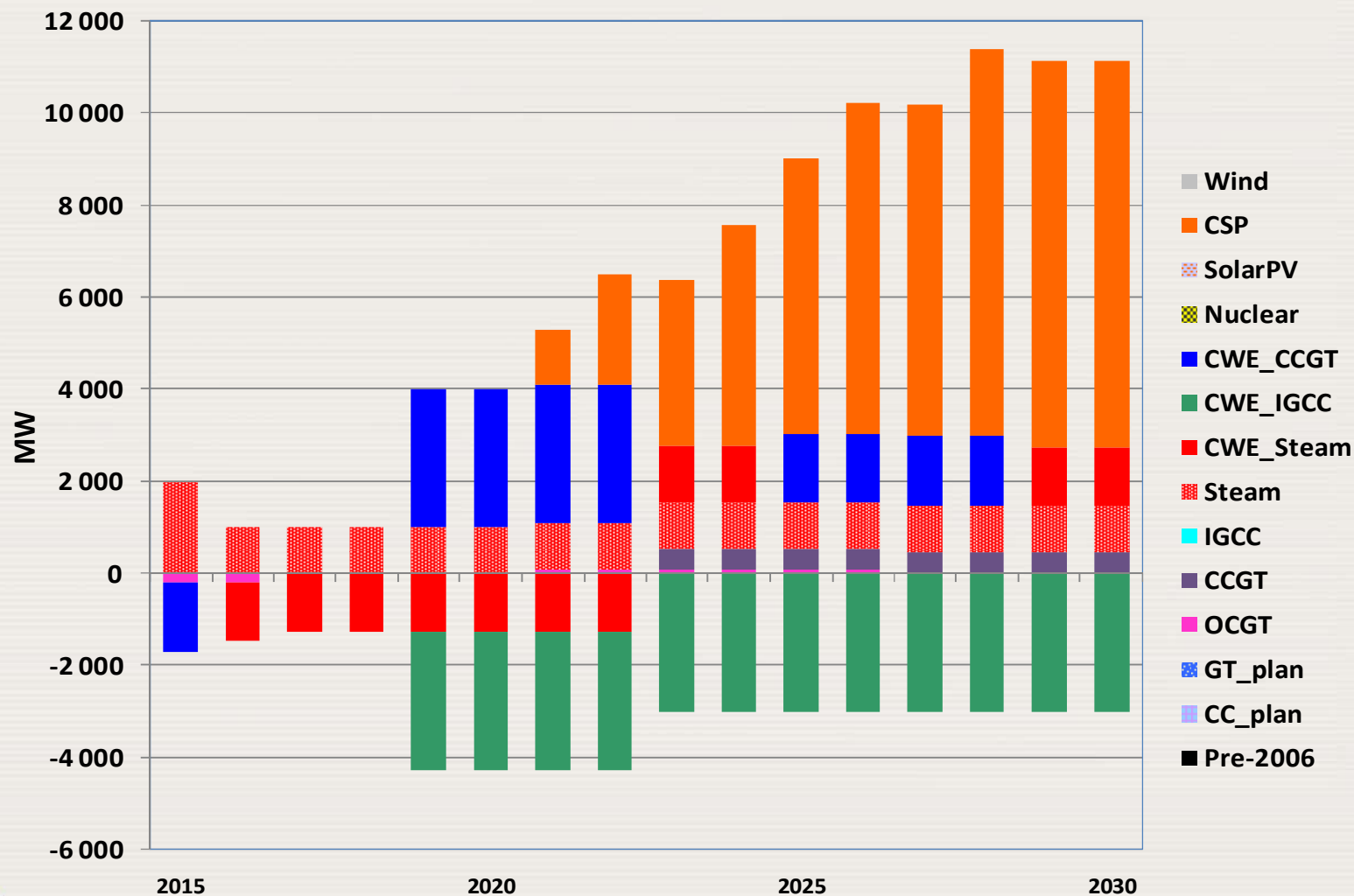
An example: Multi-resource analysis

Supplying electricity and water (with limited flexibility)



An example: Multi-resource analysis

Adding reverse osmosis water production technology



Training and technical assistance



Mainly provided under TC projects

- Inter-regional, regional and national training courses
- Fellowships
- Follow up missions

But also through other channels(such as tele-support system)

National TC projects

- Initiated by individual Member States
- Address priority issues for national development
- Help establish systematic planning for energy sector development

Some National Projects in 2007-2008

Belarus; Haiti; Jordan; Mexico; Thailand, Tunisia

Ten National Projects in 2007-2008 in Africa

Algeria, Botswana, Burkina Faso, Chad, Ghana, Ivory Coast , Mauritania, Niger, Sudan

Four New National Projects in 2009-2011 in Africa

Malawi, Botswana, Burkina Faso, South Africa



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Regional TC projects

- Programs and activities are established in the AFRA coordinators meeting
- Address issues of common interest in the region
- Solve similar problems by exploiting the benefits of synergy
 - **Africa:** Strengthen planning capacities for sustainable energy development
 - **Africa:** Increasing awareness at decision making level about the requirements and challenges related to the desirability of a nuclear power program
 - **Latin America:** Building capacity for the development of sustainable energy
 - **Arab Asia:** Planning and Developing Nuclear Power

Project impacts

- Directly influenced the decision making on the national long-term electricity planning and the role of nuclear power
(China, Korea, Lithuania, India, Indonesia, Pakistan and Vietnam)
- Provided support for establishing systematic national electricity planning
(Bangladesh, Malaysia, the Philippines, Poland, Romania and Sri Lanka)
- Provided the planning skills, knowledge, expertise to help the management of electricity/energy and environmental authorities
(All Member States)

New directions – CLEWS: Climate Land Energy Water Strategies

- 7 academic papers
- Started in 2009
- Side events at 3 CSDs
- One PhD being supported
- Coordinated IAEA research project
- Active collaboration with several key analytical groups
- Development of case studies



The IAEA moves to address resource conflicts under a joint initiative

PROVIDING “CLEWS” CLIMATE, LAND-USE, ENERGY AND WATER STRATEGIES

“In our work we had previously looked over issues related to other resources and focused simply on energy. When concern over biofuels arose, we began to see energy, food, and water conflicts start to enter into the equation,” notes Hans-Holger Rogner, Head of the IAEA’s Planning and Economic Studies Section after consultations with colleagues in other departments. “We realized that a different modelling approach may be needed. We could employ models for energy planning methodologies and integrate them with other resource planning, such as those for water and land, to get a bigger picture of how use of one resource impacts another.”

The systems approach: A simplified scheme of some climate, land, energy and water interactions

At the heart of the new IAEA approach is the system. At various points in the system there is a nexus between elements of the climate as well as land, energy and water. Communities desperately depend on all of these. But, planning and resource management activities often occur in separate and disconnected institutional entities or models. These can be contradictory, expensive and cause tensions – especially where resources are scarce. For communities who live in a world with finite resources and growing demands - finding cost effective, integrated, sustainable strategies is an urgent need.

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A JOINT IAEA INITIATIVE OF THE DEPARTMENT OF NUCLEAR SCIENCES AND APPLICATIONS' (NSA) (ISOTOPE HYDROLOGY, THE JOINT RAD/IAEA DIVISION'S (NSA'S) SOIL, WATER AND CROP NUTRITION AND WATER MANAGEMENT, AND THE DEPARTMENT OF NUCLEAR ENERGY'S (NE'S) ENERGY PLANNING.

New directions – CLEWS: Climate Land Energy Water Strategies

Water, energy and food are required for survival and development but they are also integrated. A framework is thus needed to aid:

- Decision making - transparently evaluate the trade-offs reflected in different options.
- Policy assessments - provide a more complete, multi-system policy assessment.
- Facilitating policy harmonization and integration - help harmonize potentially conflicting policies.
- Technology assessments - allow a more inclusive assessment of technological options.
- Scenario development - elaborate consistent scenarios of possible socio-economic development trajectories
- Identifying synergies - considering the multiple benefits of each option will yield better estimates of the overall development potential of each.



The IAEA moves to address resource conflicts under a joint initiative

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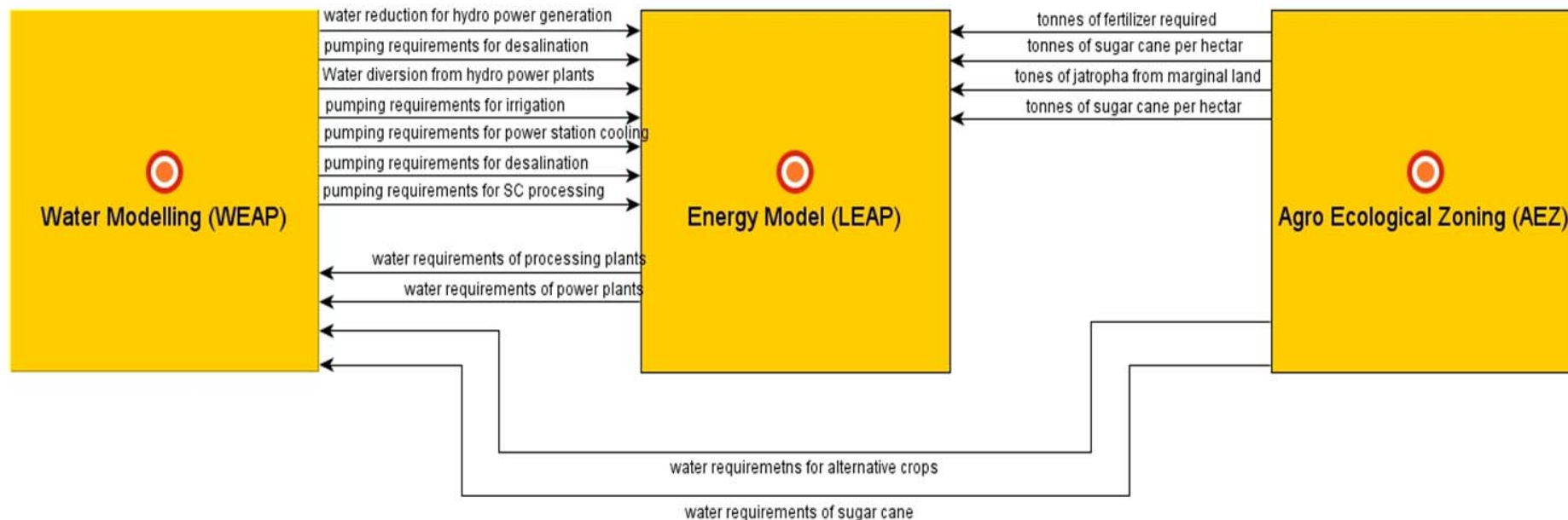
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New directions – CLEWS: Climate Land Energy Water Strategies

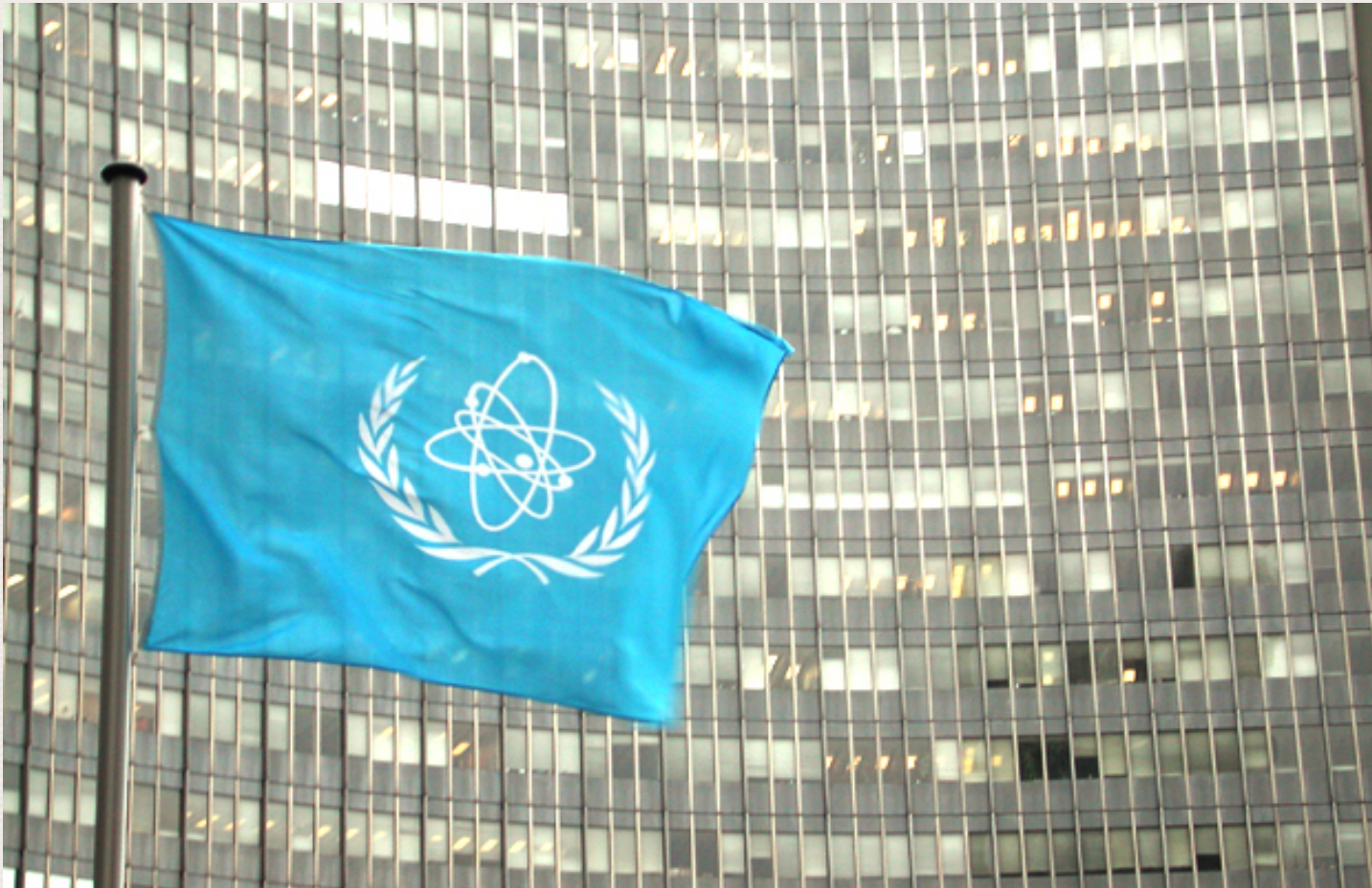


- Application of a toolkit in a consistent framework
- Development of a 'toolkit'
- Eventual multi-agency support

Ps: CRP Info

- Coordinate research project:
 - If interested please get a form (see Sebastian)
 - Submit it and;
 - Contact the IAEA-PESS section head:
 - Holger Rogner: h.h.rogner@iaea.org

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...atoms for peace.