IIASA’s Role in Addressing Major Global Challenges

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Retreat of the UN EU Heads of Mission
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Major Global Challenges

- The industrial revolution led to unprecedented levels of affluence and production, but also inequity;
- The unintended consequences demonstrate significant impacts on our social and natural environments transcending planetary boundaries.
- Overcoming formidable global challenges requires scientific foundations for understanding, formulating effective response strategies and the multi-lateral cooperation for action plans forward.
Food for a Week, Displaced Family, Chad
Global Educational Attainment

Source: Lutz et al. (2007)
Diffusion of Democracy

Slavery Abolishment

Participatory

1863
United States of America

1906
China

1948
UN Declaration of Human Rights

Source: Naki & Rogner, 2012; Modelski & Perry, 2002; 2010
Urbanization World

- IIASA SRES A2r scenario
- IIASA SRES B1 scenario
- IIASA SRES B2 scenario

Source: Grubler, 2007
Urbanization World, UK, BRICs

Source: Grubler, 2007
Earth is Warming

Data: NASA 1880-2010

Global warming predicted
(Sawyer, Nature 1972,
Broecker, Science 1975)
Global Carbon Emissions

- Peak by 2020
- Reductions of 35-75% by 2050
- Almost zero or negative in the long term

Source: Riahi et al, 2012
WEU: 21% of demand below renewable density threshold

EEU: 34% of demand below renewable density threshold
Policy background

- EU climate policy has set emission reduction targets of 20% below 1990 levels in 2020 to be achieved through measures implemented by MS.
- EU climate policy has set renewable energy and biofuel targets for 2020 to be implemented by MS.
  - Increased demand for bioenergy, timber, pulp and paper will lead to a decline in the forest sink.
- Decline in deforestation in the Brazilian Amazon (0.47 Billion $) lead roughly to the same GHG savings as the Emission trading system (411 Billion $).
Results: Baseline development

Emissions from forest management (excl. deforestation and afforestation) in MtCO₂ (GgCO₂) per year for EU countries (excl. Cyprus, Greece and Malta)

Bottcher et al. 2012
Integrated perspective to development of EU air quality legislation offered by IIASA’s GAINS model

GAINS used as the central analytical tool for:

2004: Clean Air For Europe Programme
2013: Revision of Thematic Strategy on Air Pollution

Despite significant improvements in the past:

There is still scope for highly cost-effective measures in the EU, for which just the gains in labor productivity from better health exceed mitigation costs.
Further gains from more integrated climate-air pollution strategies

Air pollution control costs for achieving the EU air quality targets

- Business as usual National energy projections (+3% CO₂ in 2020)
- PRIMES energy scenario with climate measures (-20% CO₂ in 2020)

Co-benefits on health and air pollution control costs demonstrated by GAINS for:
- Climate & Energy Package,
- EU 2050 Roadmap,
- and other Commission climate proposals.

Source: IIASA GAINS
Energy Policy Costs (% GDP)

- Only Energy Security
- Only Air Pollution and Health
- Only Climate Change

Added costs of ES and PH are comparatively low when CC is taken as an entry point.

Source: McCollum, Krey, Riahi, 2012
2030 Energy Goals

- Universal Access to Modern Energy
- Double Energy Efficiency Improvement
- Double Renewable Share in Final Energy

Aspirational & Ambitious but Achievable
Sustainability Transformation
“Doing More with Less” within Boundaries

Legitimacy of BAU eroding → Increasing problem perception

Growing number of actors of change:
• green businesses
• cities
• civil society
• science
• IGOs (UNIDO etc.)

→ Values and norms
→ Policy regimes

Vision: Sustainable Future

Time

Transformation Diffusion

Source: WBGU, 2011