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GEA Director

IIASA and its international partners present

www.GlobalEnergyAssessment.org

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Need for an Energy Assessment

- The world is at a critical juncture for energy policy, new challenges have emerged, while old ones remain

- Previous studies do not identify the strategies and solutions needed to ***comprehensively address*** today's major energy and energy-related challenges in an ***integrated*** way

GEA Objectives include:

- ***Science based, comprehensive, integrated, and policy-relevant*** analysis of issues and options related to:
  - Energy and sustainability challenges
  - Resource and technology options, demand and supply
  - System issues, scenarios
  - Policy options
- Local, Regional, and Global dimensions

integration of knowledge clusters

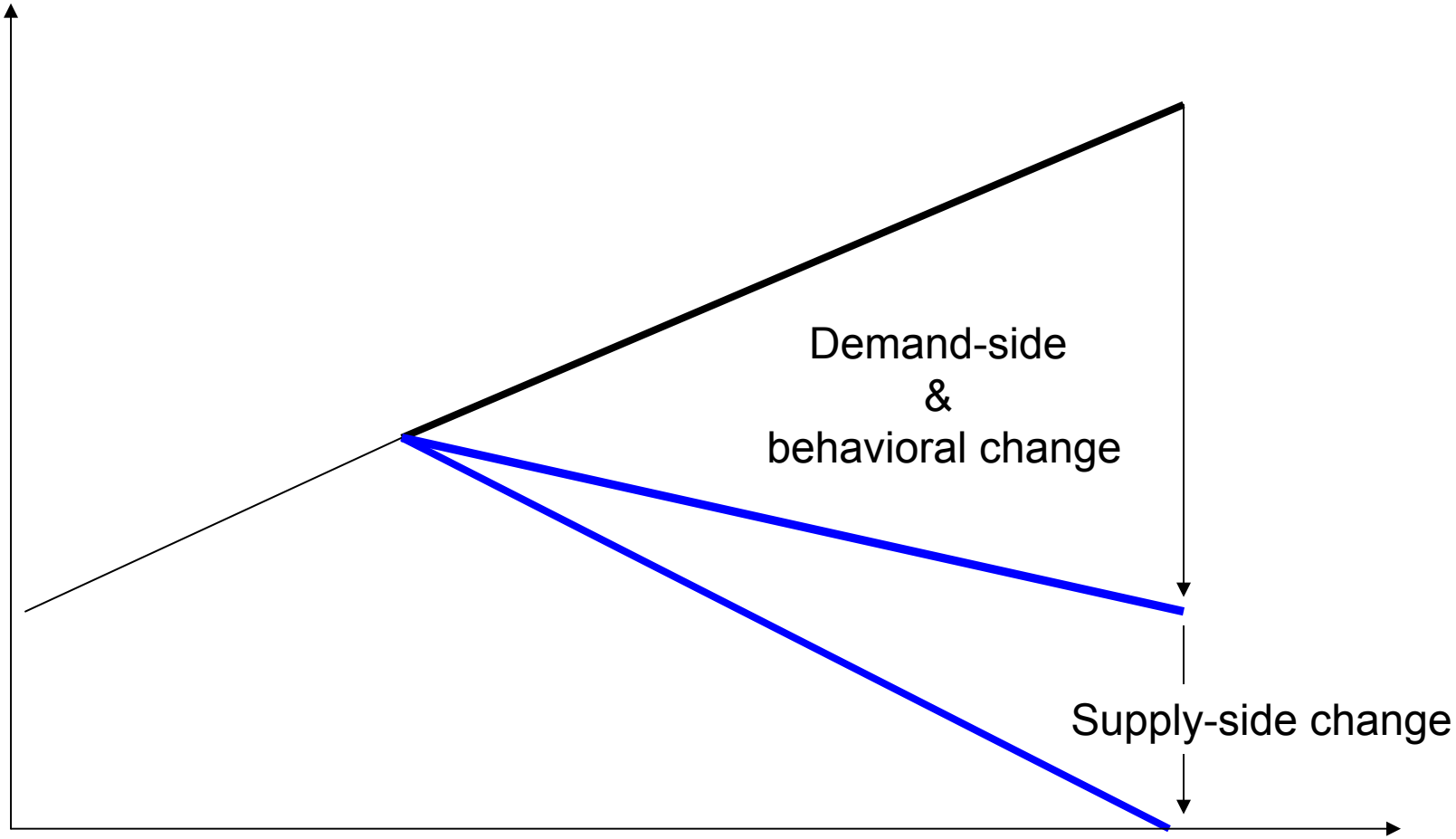
- **Cluster I** characterizes nature and **magnitude** of challenges, and express them in selected indicators
- **Cluster II** reviews existing and future resource and technology **options**
- **Cluster III** **integrates** cluster II elements into systems, and links these to indicators from Cluster I
- This will include energising of rural areas, land use, water, urbanisation, life-styles, etc.
- Scenarios, using numerical models and storylines, will be used for the **integration**, in an **iterative** fashion
- **Cluster IV** assesses policy options, and specifically identifies **policy packages** that are linked to scenarios meeting the needs, again in an **iterative** fashion.

Main Transition Strategies

- End-use and efficiency focus with contribution of supply GEA-Low (Di-Ana)
- Supply-side focus with contribution of efficiency GEA-High (Anan-D)
- Balanced contributions of measures GEA-Mid (Kir-K)
- Overall socioeconomic development goals are met in all scenarios (intermediate population & GDP)

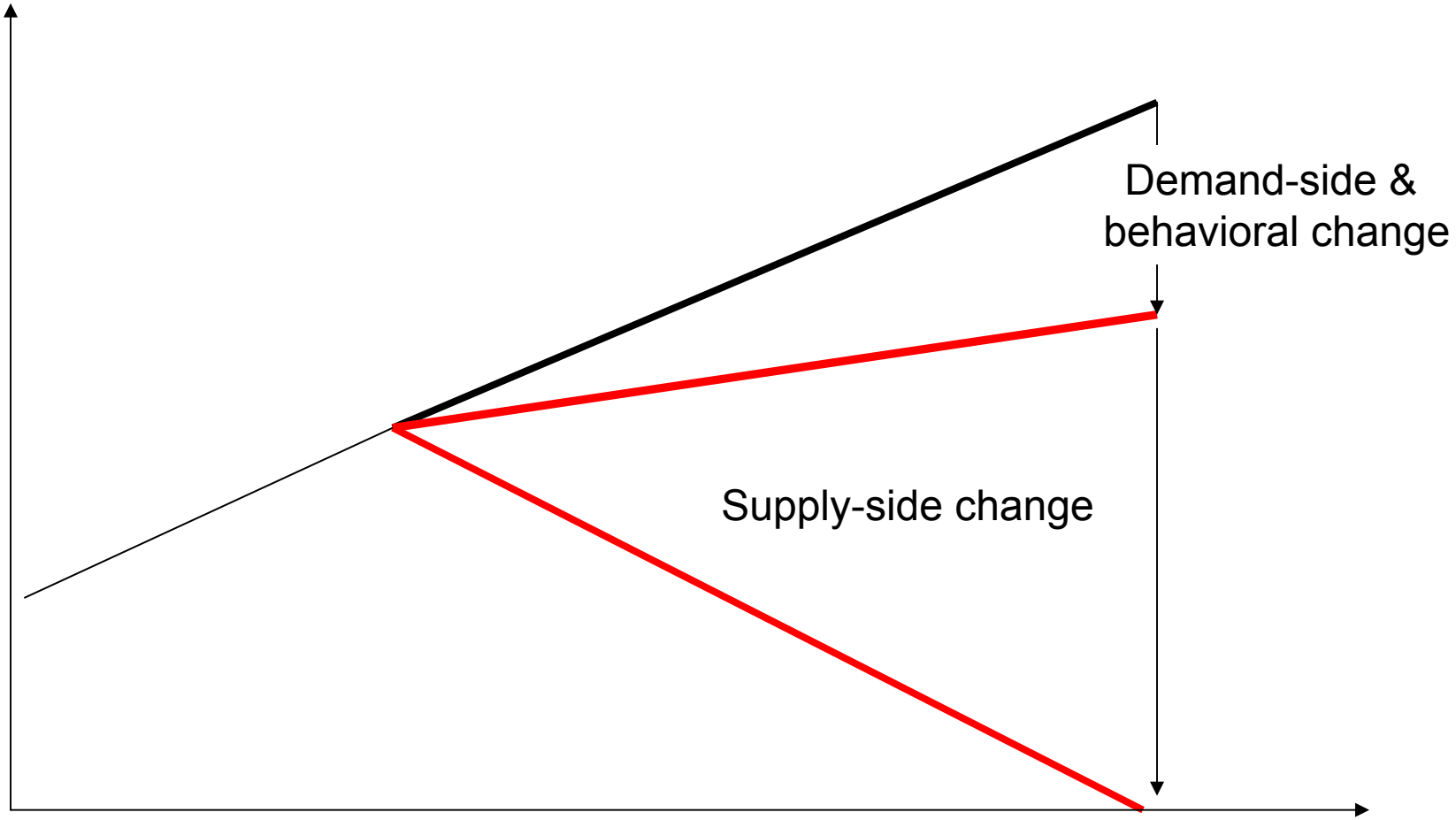
“GEA-L”

Di-Ana



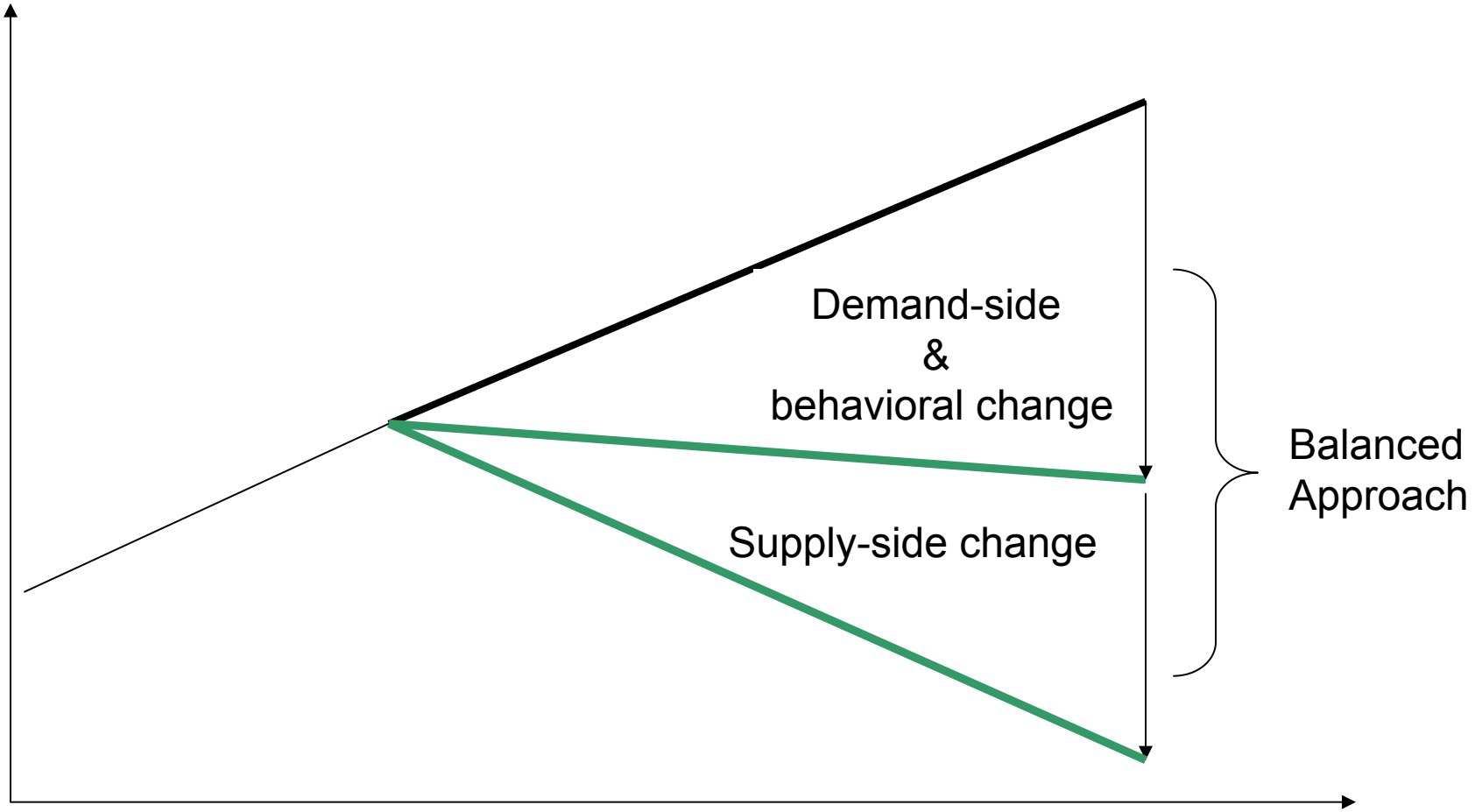
“GEA-H”

Anan-D



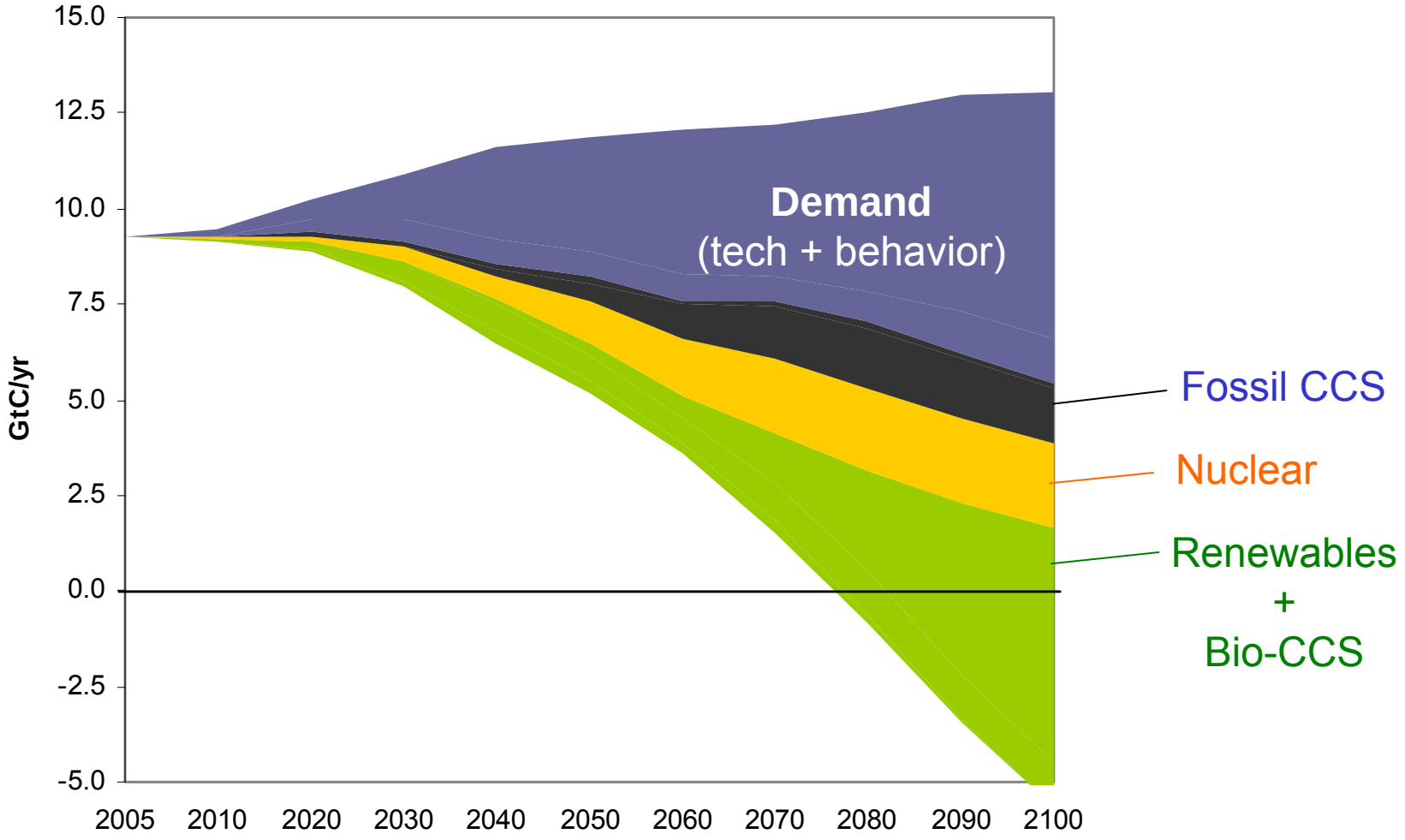
“GEA-M”

Kir-K


Demand-side
&
behavioral change
Supply-side change
Balanced
Approach

CO_2 Emissions Reductions

GEA-I



Trade-offs and Synergies

Focus Security and Climate Change Objectives

- Aim to explore policy trade-offs and synergies:
  - different temporal scales
  - alternative objectives
  - Requires multi-objective analysis
- Scenario sensitivity analysis for a combination of different targets for:
  - Short-term GHG and pollutant emissions
  - Long-term climate target (probability of staying below 2C)
  - Short-term security targets (limiting regional trade)
- Multi-criteria optimization

Towards a more Sustainable Future

- The *magnitude of the change* required in the global energy system will be huge
- The challenge is to find a way forward that addresses *simultaneously* climate change, security, equity and economics issues.
- *Paradigm change is needed*: radical improvements in energy end-use efficiency, new renewables, advanced nuclear and carbon capture and storage.
- Needs to be *globally integrated* but with maximum support of countries and local levels.
- In the best spirit of science: *fact-based and peer-reviewed*

Confronting the Challenges of Energy for Sustainable Development: The Role of Scientific and Technical Analysis

IIASA

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