SCAR
Standing Committee on Agricultural Research

Workshop on National Bioeconomy Strategy

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Setting the Bioeconomy R&I priorities in Europe - Experiences from EC Committees and other Strategic Bodies

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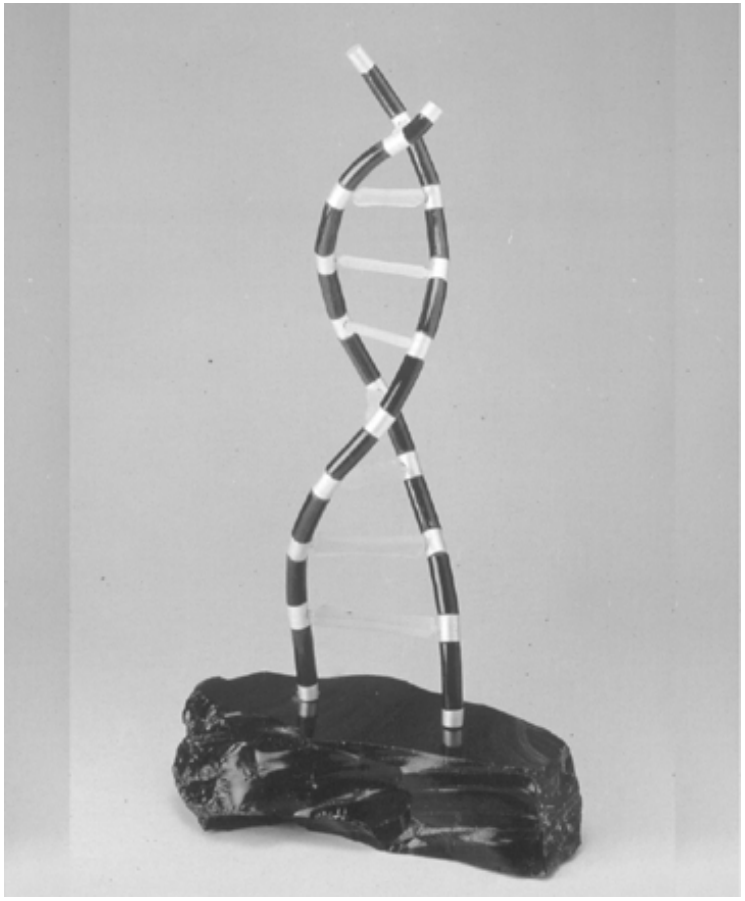
N.B.: Personal opinions and lessons from

- **FAST (Forecasting and Assessment of Science and Technology, 1982-1986)**
- **SAST (Strategic Analysis in Science and Technology, 1990-1994)**
- **CdP (Cellule de Prospective, 1992)**
- **ETAN (European Technology Assessment Network, 1995-2000)**
- **Monitoring Biotechnology Unit activities (1996-1997)**
- **Observer of the proposal evaluation process (2000)**
- **Foresight-based research policy activities (2000-5)**
- **EUREC (European Renewable Energy Centres, 2000-2)**
- **KBBE External Advisory Group (2007-2013)**
- **SCAR Biotechnology Strategy Working Group (2017-)**

R&I Supply of Bioeconomy Solutions: DNA, 1962



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R&I Demand of Bioeconomy Solutions: Club of Rome, 1972

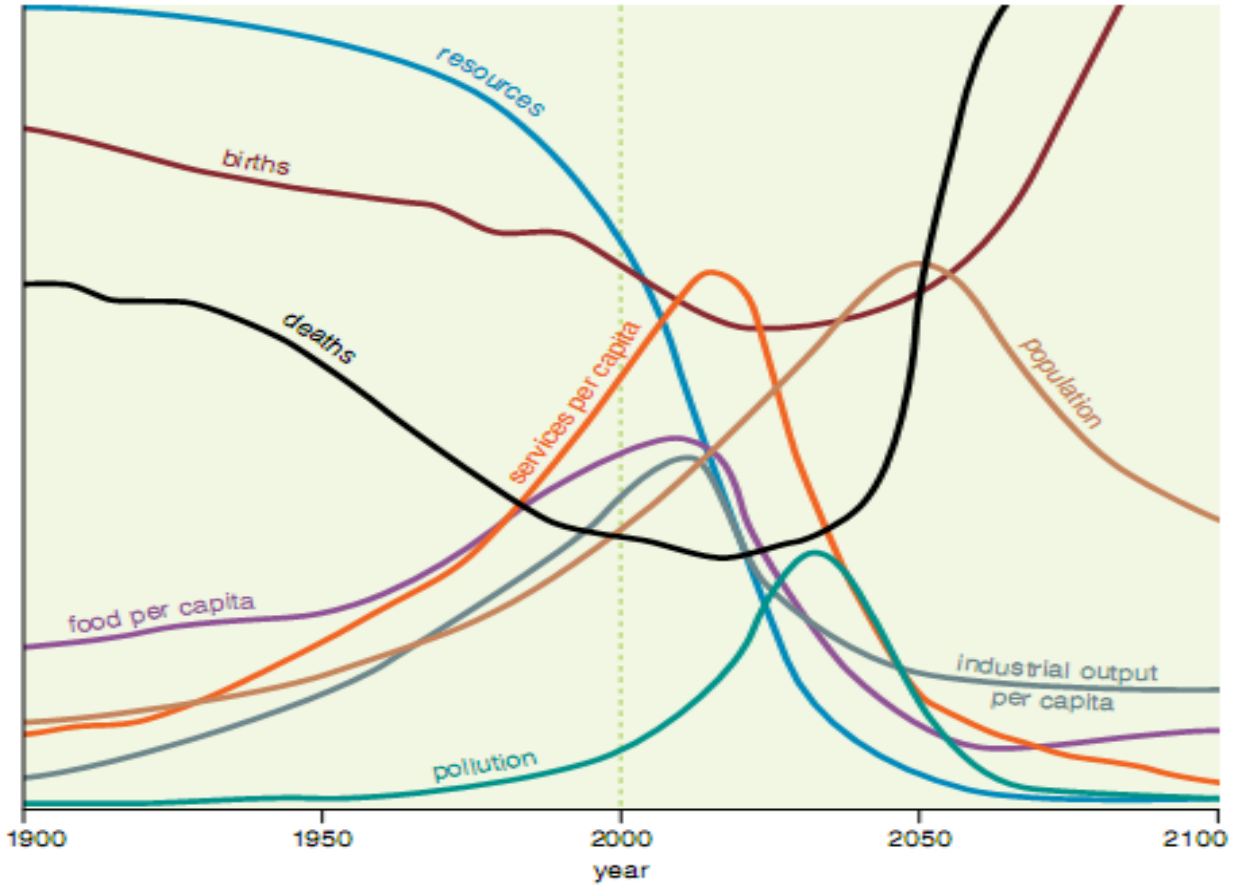

Figure 7. The original projections of the limits-to-growth model examined the relation of a growing population to resources and pollution, but did not include a timescale between 1900 and 2100. If a halfway mark of 2000 is added, the projections up to the current time are largely accurate, although the future will tell about the wild oscillations predicted for upcoming years.

Strategic Intelligence Toolbox for R&I Priorities

- **Evaluation** (ex post, ex ante, interim)
- **Valuation** (quantification)
- **Review** (peer, monitoring, observing ...)
- **Assessment** (technologies, sustainability)
- **Impact** (environmental, socio-economic, ...)
- **Extermalities** (economic, social, ecological**)**
- **Foresight**
- **Forecasting**
- **Long-range planning** (de-centralised, bottomup)
- **Dynamic modelling** (systems approach)
- **Stakeholders** analysis, decision-making support

FAST: Early Mapping the Big Picture

- **Established: 1978**
- **OTA Model: Office of Technoloy Assessment, USA**
- ***Bio-Society:* One of the key topic areas**
- **1982-1986: *Alternative Uses of Land – The Agro-Chemo -Energy Complex***
- **Contractors: UK, IRL, GR, GE, IT**
- **Some key findings:**
  - **Research on known and new industrial crops**
  - **Agriculture, food, energy and other industrial policy effects**
  - **Significant role of environmental and social factors**
  - **Complexity management required**
- **Spill-over effects on EC Research priorities**
- **Early identification of „sensitive" points and aspects**

SAST: Bringing Research Close to Application

- **Run in parallel with FAST, within MONITOR Programme**
- **Emphasis on short-to-medium term effects**
- **SAST Projects defined based on Commission Services requests – Project Steering Committees from EC Units**
- **Examples: New Industrial Countries, Greening of Industry, Logistics**
- **Project *"Innovation in Agro-Biotechnology"* (1990-1994)**
- **Contractors: UK, B, FR, PT – Expert: GR, Topics:**
  - **Fertilisers, Crops, Animal Production, Fish, Nonfood Industries, Quality Aspects, Country-Level Integrated Systems**
- **Identification of Research and Innovation priorities**
- **Key roles: regulation, socio-economic factors, policies**

CdP: Bringing Issues to Top Decision Level

- **Role: To provide foresight- and other future-oriented insight on topics of interest for the Office of the European Commission President**
- **Topic to be assessed: *Biomass Utilisation***
- **Members of the Study Group: Representatives of Commission Services with relevant responsibilities**
- **Some of the key findings:**
  - **Serious complexity issues to be resolved**
  - **Strategic role of energy as part of the project vectors**
  - **Multi-focal research and innovation activities, i.e., biomass primary production, bioenergy conversion and use**
  - **Critical points for efficiency include the proper assessment of the bioresources availability and their supply chains**

Forecasting & Assessment in Post-FAST Era

- ***ETAN*: An ambitious mega-network aiming at putting some order in the fast growing field of assessment tools – Some relevant priority topics have arisen:**
  - **Ageing, Globalisation, …**
  - **ETAN Evaluation Panel Report**
- ***Impact Assessment*: New "branches" developing from the "tree" of useful methods and approaches, e.g.,**
  - **Health Impact Studies**
- ***Foresight Unit*: Running targeted future-oriented actions**
  - **Expert Groups on European Foresight, Converging Tech, …**
  - **Networking of National Foresight Exercises (GR, CY, ES, ML)**
- ***IPTS*: Institute for Prospective Technological Studies**
  - **IPTS Conferences, IPTS Projects, IPTS Report**

Evaluation to Improve Process/Product Quality

- **MONITORING the ongoing activities of the Biotech Unit**
  - **Programme logistics and management aspects**
  - **Key Issues: industrial participation; SMEs; training; IPR; regulations; public perception; other targeted**
  - **Horizontal aspects: national; international; with EC services; cohesion' other key policies; preparing FP5; strategic points**
- **OBSERVER of the Proposal Evaluation Process**
  - **Monitoring novel process elements**
  - **Assessing of quality achievements and difficulties**
  - **Identifying points to strengthen, e.g. peer review**
  - **The key role of process logistics and strategy**

Setting Bioenergy R&I Priorities: A Case Study

- **EUREC: The European Renewable Energy Centres Association, with headquarters in Brussels**
- **Board of Directors: Representing all renewable energies, including bioenergy**
- **Board Mandate: To produce updated versions of a major publication "The Future of Renewable Energies"**
- **The 2nd version, published in 2002, had a chapter on Biomass, where R&I priorities were defined by a future-oriented approach, using Strategic Intelligence Tools, and was followed by an Annex with technical data**
- **This chapter was translated in various European languages and its advocated approach was also used with success in a post-graduate course on biomass**

KBBE Advisory Panel: Critical Points for European Bioeconomy

- Linking more closely biobased research to that of the other related EU-funded RTD fields (environment, energy, and health);
- Strengthening social and economic aspects within biobased research;
- Enhancing (eco)systems thinking, especially to improve understanding of complex bioeconomy phenomena, including sustainability issues;
- Need for an interdisciplinary approach across the programme mainlines;
- Focus on a small number of strategic research topics and aspects; major examples include
  - (a) bio-waste as a biomass resource, and
  - (b) international collaboration linked to growth economics;
- More emphasis on the targeted development of appropriate tools, especially in fast growing fields like bio-informatics.

Promoting “Green” Bioeconomy by Research

The 10 “Golden Rules

- An emerging space for vital innovation
- The key role of research: to “unlock” the potential of bio-world
- Better understanding of complex phenomena involved
- Planning and implementing knowledge-based action
- Examples of complex topic areas to be investigated: low-input farming, soil biosystems, nutrition disorders, sustainable non-food crops, novel biorefineries, landscape ecology
- Environmental biotechnologies as a potential research flagship
- Design of environmentally compatible bio-solutions
- Significant role in social and economic global development
- Responding to societal concerns, and assessing risks
- Accompany research by appropriate information, communication, dissemination and crisis-management components

SCAR Bioeconomy StrategicWorking Group

- **Large and multi-disciplinary composition of participants**
- **Rich, multi-topic meeting agendas**
- **Meetings in various EU locations, in collaboration with local partners**
- **Learning from previous exercises**
- **Emphasis on social, economic and other non-technical aspects of bioeconomic change**
- **Coordination with national, regional and international dimensions**
- **SCAR's successful background foresight experiences**
- **Action still in its infancy – A lot to be expected…**

Bio-Greening R&I – A Crossroads History

THE BIO-PATH

1962: Nobel Prize for DNA

1970s: Molecular Biology

1980s: Genetic Engineering

Genomes Mapping

1990s: Crises-like Phenomena

GMOs Public Debates

2000s: Biobased Development

Bio-Info-Nano Hybrids

2010s: Circular Bio-Economy

THE GREENING PATH

1972: “Limits to Growth”
Club of Rome Report

1970s: Oil Crises, Research on Renewable Energies

1987: “Our Common Future”
Defining Sustainability
Brundtland UN Report

1990s: Climate Change debate
Kyoto Protocol, IPCC

2000s: Greening strategies
Greening policies

2010s: Circular Green Economy

A “Green” Bioeconomy World in 2050

A View of the Future – A Green Utopia?