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Zero-Order Review of STI Roadmaps and Strategies

Nebojsa Nakicenovic

Deputy Director General

International Institute for Applied Systems Analysis

Professor Emeritus of Energy Economics

Vienna University of Technology

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What is Technology Innovation?

- H – Hardware (artifacts, “machines”)

  +

- S – Software (know-how, “know-why”)

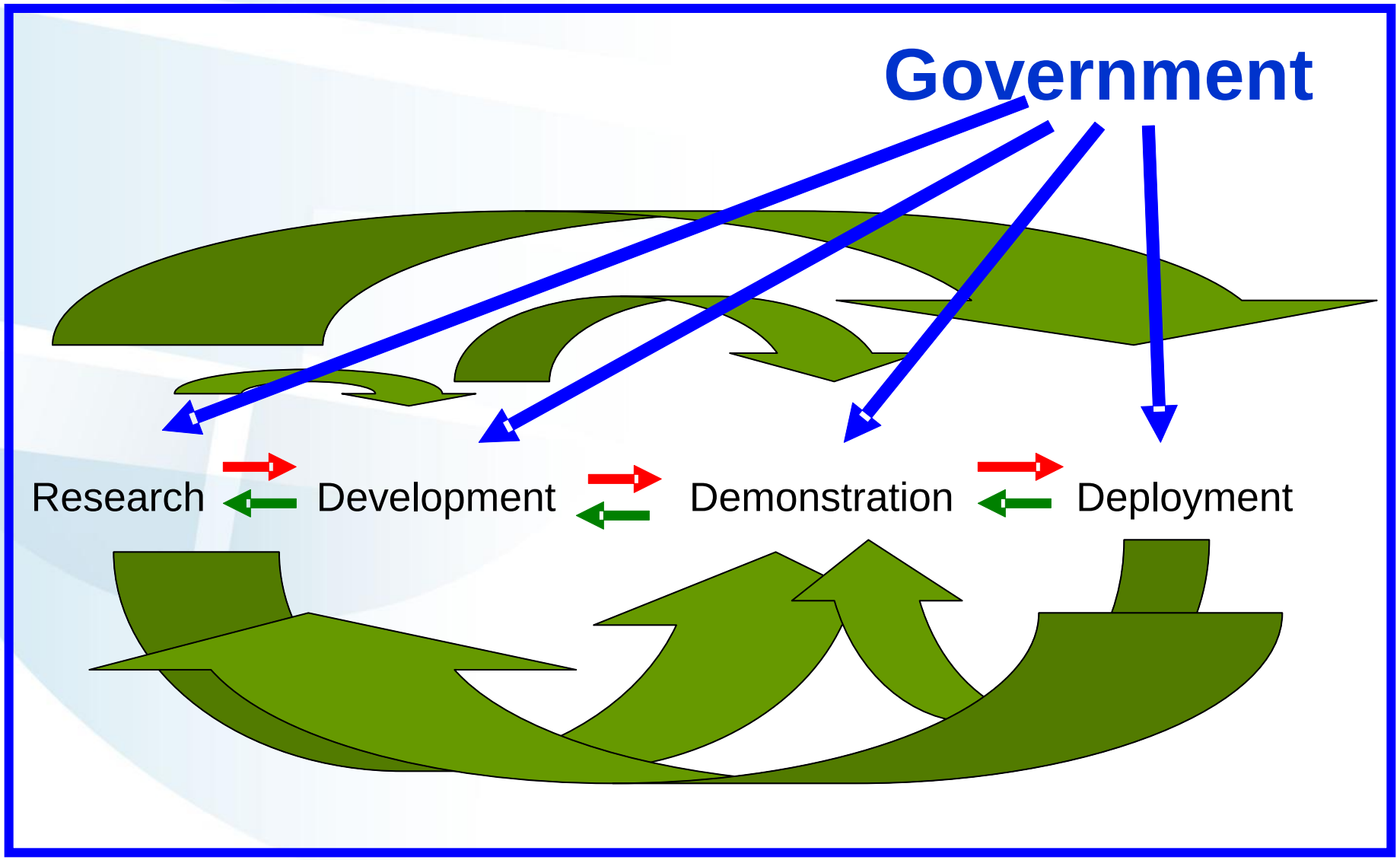
  +

- O – “Orgware” (institutions, regulation, “rules of the game”)

Technological Change
Dynamic, Cumulative, Systemic and Uncertain

- Incremental – gradual (continuous) and cumulative improvements
- Abrupt – radical, discontinuous and disruptive as “gales of creative destruction”
- Add as many mail-coaches as you please, you will never get a railroad by so doing. [Schumpeter, 1935/1951, 136

SDI: Dynamic Process



STI Policy Coherence

- Paradox of STI:
  - cause of problems, e.g. as negative externalities
  - but solution, if socially and environmentally sound
- Key to
  - Understand inter-relationships and interdependencies
  - identify trade-offs and inherent in STI for SDGs (nationally and globally)
  - leverage synergies among STI policies and SDGs
- Tools to support policy coherence:
  - integrated assessments
  - systems thinking
  - road-mapping

Assessed STI Policy Documents

Roadmap: strategic plan with specified time frames to achieve stated goals and outcomes

Following included: roadmaps, state plan, strategy, strategic plan, program, strategic document, action plan, initiative etc. as well as policy reviews.

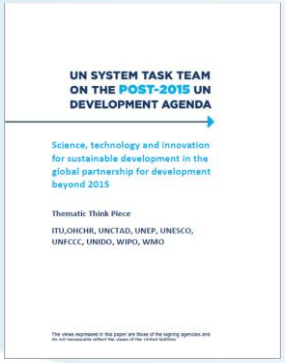
150 documents from 52 countries (98% of global R&D):

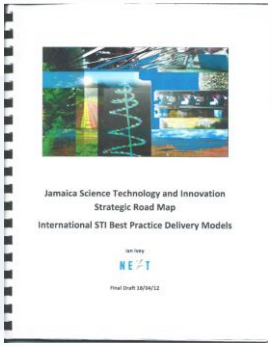
- European Community members
- 35 OECD members
- Argentina, Brazil, the People's Republic of China, Colombia, Costa Rica, Egypt, India, Indonesia, Lithuania, Malaysia, Peru, the Russian Federation, South Africa and Thailand

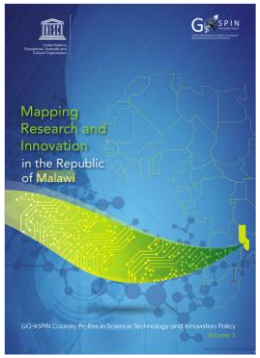
World Cloud from Titles of STI Policy Literature

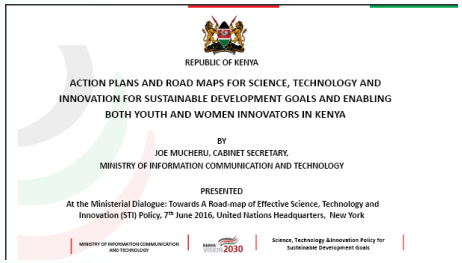
World Cloud from Titles of National STI Policy Documents

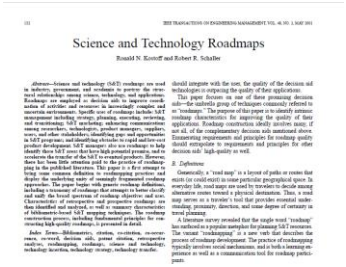
Exemplary STI Policy Reports











Main themes of STI policies

- Governance
- Globalization of innovation policies
- Facing new social and environmental challenges
- Innovation in firms
- Sectoral innovation
- Universities and public research
- Skills for innovation

Recent trends in STI policies

- **Strengthening domestic competitiveness**
  by raising innovative capacity of domestic industry, financing business innovation and entrepreneurship, support to SMEs and their internationalisation
- **Rationalizing public research spending**
  improving ties between public and private research, encouraging interdisciplinary research and open science, popularization of science, privileging policy tools not requiring additional spending e.g. public procurement and tax incentives
- **Ensuring future talent and human capacity**
  skills for innovation – boosting science, technology, engineering and mathematics
- **Improving STI policy and governance**
  through policy evaluation, responsible research and innovation (RRI) policies and participatory approaches, involving industry and wider society upstream in the debate to shape and exploit STI

Benefits of STI Roadmaps

Normative method for describing desirable futures, the role of STI and needed research and development activities:

- Identify opportunities and gaps in STI programs
- Plan allocation of resources including time, financial resources and skills
- Facilitate communications among stakeholders
- Improve STI investment decisions by developing consensus among decision makers
- Create a multi-disciplinary and cross-functional working environment with the better alignment of decision making in research, industry and policy making

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THANK YOU

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naki@iiasa.ac.at

SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS