FIGARE (Finnish Global Change Research Programme)
DEVELOPING CONSISTENT GLOBAL CHANGE SCENARIOS FOR FINLAND (FINSKEN)

SOCIO-ECONOMIC SCENARIOS FOR FINLAND

FFRC Research group
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I. Tasks

Since the sixties, scenarios have become a major concept and methodology in futures research. The very basic idea of scenario analysis is to analyse various sources of uncertainties and risks in different socio-economic contexts. Scenarios can be used in the planning and strategy formulation of global, domestic, local climate change policies. In Finsken research project socio-economic scenarios of IPCC scenario framework are going to operationalised in the case of Finland. Thus, socio-economic scenarios of Finsken are country level operationalisations of IPCC SRES scenarios. The role of Finland Futures Research Centre in the research project is to interpret SRES marker scenarios (story lines) for Finland using various modelling methodologies as well as expert team and other research evaluations. Multiple scenarios allow for multiple assumptions about the future, including potential changes in the structure of the relationships among the critical components of the national socio-economic system. Thus, multiple scenarios allow also decision-makers to formulate climate change strategies and test them in alternative future environments.

The main task of the research project is to present and analyse future projections of Finnish population and economic development, as well as to apply technological and social foresight studies. Operationalisation of IPCC scenarios is the main task of the study.

Secondly, also methodological issues are developed in the study. In the study different scenarios are provided to incorporate a diverse array of factors including economic, demografic and technological elements. One of the major challenges of the study is to make explicit the correlation between these fundamental systemic elements (economic activity, demografic structure, technological change, energy use and green house gas emissions).

Thirdly, attention is paid to the future oriented analysis of the community infrastructure development, especially in relation to energy production infrastructure and transportation systems.

Fourthly, during the research project team conducts stakeholder interviews. The idea of stakeholder meetings is to discuss IPCC scenarios from sector perspectives.

II. Status

Task 1: Operationalisation of IPCC scenarios

In Finsken, FFRC has focused in three types of research. First, some theoretical basic research concerning scenario techniques and methods are done. Secondly, empirical analyses concerning Finnish economy have been done in order to conceptualise the starting points of socio-economic scenario analyses. Thirdly, strongest effort has been paid to scenario modelling of IPCC Marker scenarios in the case of Finland. In order to operationalise IPCC scenarios in the Finnish economy a long-run scenario accounting models is developed. Now, a working version of model is ready and first socio-economic analyses can be presented on the basis of modelling activity. During the research project some international global climate change analyses are also made. Special emphasis is paid on OECD country, European and Nordic analyses.

The very basic ideas of a long-run scenario accounting model are the following:

1. A model is based on SNA accounting system and includes sectoral energy statistics.
2. A model gives flexible possibilities to evaluate potential long-run socio-economic changes in the Finnish economy.
3. A accounting model gives possibilities to construct different kind variations of baseline IPCC scenarios (Global Markets, Global Sustainability, Provincial Enterprise and Local Stewardship).
4. A model gives possibilities to vary following policy variables: (1) Sectoral economic growth, (2) the speed of technical progress in sectoral energy production, (3) productivity of labour in different sectors of the economy, and (4) the sources of energy.
5. A model is an integrated greenhouse gas emission accounting system; and
6. A accounting model provides empirical results concerning important, policy relevant transitions paths of the Finnish economy. Transition paths cover the years 1975/1980-2100.

The socio-economic component of FINSKEN seeks to describe possible future socio-economic and technological developments in Finland in sectors, which are likely to be sensitive to the impacts of environmental change. Specific Finnish

Transitions are transformation processes in which society changes in a fundamental way over a generation or more. Although the goals of a transition are ultimately chosen by society, governments and private companies can play a role in bringing about structural change in a stepwise manner. Their management involves sensitivity to existing dynamics and regular adjustment of goals to overcome the conflict between long-term ambition and short-term concerns. The developed model provides new perspectives to

think potential socio-economic transition processes of the Finnish economy, when climate and energy policy alternatives are studied .

These trade-off transition analyses of the Finsken study gives new results concerning socio-economic policy choices of the futures development. In the current form of model it is possible to account the following policy relevant variables: GDP, population, energy demand, CO_2 emissions, labour demand, labour reserve, GDP/cap, GDP/labour reserve, CO_2/capita, CO_2/energy demand, energy demand per/GDP, labour demand/GDP and GDP per labour, energy demand/capita, energy demand/labour. New other variables (especially other greenhouse gases and socio-economic variables connected to land use) are under the research work and these variables are going to be added to the policy choice transition analysis tool kit, but results concerning these variables are not presented in the current lecture.

Task 2: Methodological issues

Special emphasis in paid on methodological discussion in the study. Some articles are published, where different kind of basic theory-based scenario frameworks have been developed. Researcher Jari Kaivo-oja has developed some ideas concerning scenario analysis in the sustainability evaluation. The main results of these developments are going to be published in his PhD study and in the final report of the study. Jari Kaivo-oja is also writing *European Foresight Handbook* with professor Ian Miles and dr Michael Keenen (PREST, University of Manchester), which provides a fresh summary of the available methodological tools in the field. This book can be used in country level foresight studies in all the European countries.

Task 3: Community infrastructure development analysis

The long-term future of national infrastructures in Finland is going to be analysed in the study. There are many alternative transition paths for regional development in Finland. These infrastructure scenario analyses are going to be presented in the form of future tables. These analyses are connected to other scenario analyses concerning infrastructures. Stakeholder interview will provide new and up-to-dated expert views to this analysis.

Task IV: Stakeholder interviews

Stakeholder interviews and background material analysis have been implemented during the spring 2002.

We have identified the following tentative list a set of 5-8 stakeholder dialogues for Finsken:

- Information and communications technology
- Agriculture and food
- Forestry and Forest industry

- Transport
- Tourism and recreation
- Energy
- General economic development
- Human health.

Each dialogue session is planned to be a half-day duration, and comprise a structured discussion addressing a few key questions and involving some experts in the field, drawn from ministries, private sector, regional authorities, public utility and research institutions. These interviews are made during the spring 2002. These interviews are a part of socio-economic scenario analyses. Compile the results of the stakeholders dialogue sessions and construct a draft set of qualitative story-lines for each of the sectors covered. Quantitative scenarios can also be developed, if data/models are available. These draft scenarios are send to some stakeholders for comment and reflection. In the end of project a seminar is organised on socio-economic scenarios to discuss the revised scenarios with the stakeholder groups. It is also possible to organise international participation and comments for the built socio-economic scenarios. These qualitative interview analyses are published as a part of final report.

III Plans for 2002

Concerning the main tasks of the project the following research tasks are going to implemented in 2002:

Task 1: Operationalisation of IPCC scenarios

The accounting model needs to be refined and final versions of scenarios must be checked. Also some additional smaller accounting parts shall be added to model. A final set of scenarios for the years 2020, 2050 and 2100 will be developed for the following socio-economic factors: population, urban/rural percentage, GDP, industrial structure, forest sector, agricultural sector, service sector and industrial sectors. These analyses are connected to other available land use and infrastructure analyses in Finland.

Task 2: Methodological issues

This task is strongly focusing on the PhD study of the mr Jari Kaivo-oja. Final version of the PhD is left to review in March 2002. According to preliminary plans, the first version of *European Foresight Handbook* will be presented in May 2002 in the European Foundation, in Dublin. Jari Kaivo-oja is also one of the authors in the Finnish book project *Foundations of Futures Studies*. This book will be published in 2002 and the book is going to be used in all national academic education programmes.

Task 3: Community infrastructure development analysis

Author has collected essential materials concerning the development analysis of Finnish national community infrastructure. These materials are going to be presented as a part of

monograph book of the project. Stakeholder interviews provide also interesting materials for this analysis.

Task IV: Stakeholder interviews

A series of stakeholder interviews (about 15 interviews) are implemented during the spring and early summer 2002.

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