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Quebec S+T Development Based on Social Needs

Foresight Brief No. 47

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Sponsors: MEDIE - The Ministry of Economic Development, Innovation and Exportation of Quebec

VRQ - Valorisation Recherche Québec

CST - The Council for Science and Technology of Quebec

Type: A National S+T Foresight Exercise

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Duration: 2003-2007

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Budget: €1.2M

Time Horizon: 2020

Science-Technology-Society Perspectives

The **STS Perspectives** project is a foresight study examining Science-Technology-Society issues, designed to mobilize Quebec's scientific and technological resources in order to address important socio-economic challenges that Quebec society will face over the course of the next 15 to 20 years. This project started in 2003 and is still ongoing.

Bridging the Gap Between Science, Technology and Society

The Council for Science and Technology is greatly concerned about how to bridge the gap between science, technology and Quebec society. This issue is very important because science and technology must be integrated in a more decisive and harmonious manner into all areas and sectors of society, if Quebec is to become a real knowledge-based society.

An attempt to bridge the gap must be made by stakeholders on all sides of the science-technology-society system through a dialogue taking place on a regular basis. Not only does Quebec society have to master scientific and technological knowledge and methodology to a greater extent in all its sectors of activity, but stakeholders from the areas of science and technology need to pay more heed to the concerns of

members of society, most notably as regards the orientation of their work and its impact. Criteria for R & D funding must therefore be such that they take social needs into account.

The **STS Perspectives** project is an attempt to directly addresses this challenge. It proposes to ask people to identify the main socio-economic challenges that Quebec society will have to face in the future and then in conjunction with scientists, provide direction efforts in research and innovation. In the sense that few of the world's foresight projects have focused on S+T demand rather than on its supply, **STS Perspectives** is a truly innovative undertaking.

Raising Awareness and Increasing Societal Involvement

The three main objectives of the **STS Perspectives** project are to:



- Raise awareness in all sectors of Quebec society as to the importance and usefulness of science and technology for understanding and resolving socio-economic problems,
- Invite the scientific community of Quebec to participate in the process of achieving social and economic goals through the application of science and technology, and
- Mobilize the partners involved in Quebec's socio-economic development, including those from the area of scientific and technological development, to determine the main challenges that Quebec society will have to face in the next few years, and to formulate the strategies required to meet those challenges.

Defining the Societal Challenges

The project includes two main phases. The first consists of a four stage Foresight study and the second phase builds on that with an emphasis on strategic planning.

Phase I of the project consists in outlining a certain number of recognized major socio-economic challenges that generate needs for new knowledge and new technology or innovation. It involves **four stages:**

Stage I: Consulting with the Quebois in order to establish the main issues of concern regarding the future and learning about their perceptions of the main socio-economic problems that Quebec will have to face over the course of the next two decades. In the fall of 2003 **6 discussion groups** were assembled in various regions of Quebec so that members could express their views on this subject. A **questionnaire** was created using information gathered from these groups in order to better identify the issues of concern to people, regarding the changes that could affect Quebec society over the next twenty years. Finally a **telephone survey** was carried out involving 1,623 residents of Quebec aged 15 and older.

Stage II: Foresight workshops brought together about one hundred participants from a wide range of backgrounds, representing various sectors of Quebec society. The theme of this workshop was 'Building the Future' and it was held in October 2004. The 104 participants were selected for their original ideas, their capacity to work in groups, their originality, their creativity, their social involvement and their ability to develop a certain foresight-related vision of Quebec. They were required to create a list of 40 major socio-economic challenges that Quebec will face in the next 20 years. As food for thought the participants were provided with a first summary of the results of the Stage I survey.

Stage III: In an attempt to reduce the list established previously to fewer than 10 or so challenges, a **consultation was then held with members of the Quebec scientific community** to take account of contributions that could be expected from science and technology. The list of 40 challenges was submitted to Quebec researchers during an online consultation conducted at the beginning of 2005. In all 1,306 researchers from university, industry, government and other circles, participated in the consultation process. More than 50 percent of respondents chose 7 of the 40 challenges.

Stage IV: The drafting of seven thematic reports by seven specialized committees, formulating and explaining the challenges and their potential science-technology components. These reports were drafted with help from about 60 experts. They presented an overview of the main fields of research which could help to address the seven challenges. They provided examples of research themes, and the range of scientific and technological disciplines concerned.

Main Results of Phase I: People's Concerns ...

Consulting the general public in Phase I of the Foresight project has allowed the organizers to better understand the main issues of concern for the Quebecois regarding the future.

Education and 'public access to knowledge' was an important issues for people, yet at the same time they viewed these matters from a very optimistic angle. **Environmental questions** also turned out to be very important for respondents, but in this case they were much less optimistic as to how these issues would unfold. This was especially true among young people. The majority of respondents in fact did not believe that the main **pollution** problems would be solved within the next 20 years.

People are less concerned about the economy as they are about the environment. Nevertheless their concern about the economy was greater than their concern about access to knowledge. A large percentage of respondents, most notably the poorest and least educated among them, are worried about the impacts of **globalization** on Quebec, in particular on the employment situation.

People are most concerned with **individual well-being**. The strongest predictions that we recorded concerning future deterioration involve the quality of family life, individual physical and psychological health, as well as the quality of the environment.

Above and beyond these important realities the Quebecois believe that Quebec society will become increasingly multicultural in nature, that the French language will decline and that at the same time the province will find itself increasingly in the grip of American culture.

Finally, people do not view the theme of politics in a very positive light. They insist rather pessimistically, that the

government will not manage to solve problems related to the deficit and the provincial debt.

The 40 challenges identified

In stage 2 of the foresight workshop, 40 main socio-economic challenges that Quebec society will have to face in the near future were identified. They can be grouped into 6 thematic categories. Without being exhaustive these are as follows:

- **Health and Life-Style:** The public health-care system, quality of life of senior citizens, nutrition, well-being, sports and leisure.
- **The Environment and Resources:** Natural-resource development, water management, green energy, transportation, waste production and fossil energy.

- **The Economy, Research and Innovation:** Priorities involving research, globalization, the solidarity economy, high value added jobs, agriculture, networks, the regions of Quebec and a highly qualified workforce.
- **Education:** Learning languages, teaching science, school drop-out and teaching in underprivileged environments.
- **Demographics and Communities:** The increasing birth rate, immigration, and issues related to specific groups such as the First Nation people and the Inuit.
- **Culture and Society:** Public participation in the democratic process, making science accessible to society, ethical considerations, reconciliation of work with family life, poverty and culture.

Main Socio-Economic Challenges

The consultation process involving researchers in Stage III of Phase I made it possible to identify seven major socio-economic challenges where research could improve our understanding of the real problems that lie behind each challenge and provide insight into how they could be tackled. The seven challenges are as follows:

- Promote the adoption of **healthy life-styles**, based on a preventive holistic vision of physical and psychological health and on efforts to make people responsible for their own health.
- Increase the efficiency of the **public health-care system** that must support an gradually aging society while at the same time controlling costs.
- Develop **natural resources** and manage waste more efficiently using a **sustainable-development** approach to the point that Quebec becomes a world leader in this area.
- Provide **high-quality education** that combines rigour, creativity, flexibility and responsible citizenship, and that is accessible to all.
- Target **strategic and priority market niches** in the areas of research, economic development and education, on the basis of current strengths and emerging sectors.
- Reduce dependence on fossil energy and make Quebec a leader in the fields of **energy efficiency** and **renewable energy**, mass transit and new environmental technologies.
- Adopt **innovative interventions for controlling poverty** and the factors that generate and maintain it, so as to stave off the consequences of poverty such as marginalisation and a sense of powerlessness as well as inequity and violence.

Research Funding as Main Priority

Besides determining the seven challenges, the researchers questioned during Stage III of the Phase I were asked to comment on scientific and technological development prospects for Quebec. Research funding was chosen by 76% of respondents as being one of the three most important challenges to be met over the next 10 years in order to promote the scientific and technological development of Quebec. The other outstanding challenges include knowledge transfer (35%), maintaining a balance between independent research and targeted research (33%), increasing private funding for research (22.7%), and promoting scientific careers among young people (17%).

Multi-disciplinary fields, centred on transfer and sustainable development

In the Stage IV of Phase I each of the seven selected challenges was presented to a group of experts charged with explaining the key related issues and suggesting the main fields of research that could help in meeting these challenges. The multidisciplinary character of the fields provided important links among the challenges. All challenges involve two important types of contributions from research:

- Understanding the challenge and
- Developing and integrating innovation in practice.

The solutions to the problems raised by the seven challenges are inevitably rely on public intervention. Furthermore, the work groups have pointed out the necessity of integrating each challenge within a sustainable development perspective.

Follow-Up on ‘STS Perspectives’

Phase II of the project began in the fall of 2005. This phase the Council for Science and Technology intends to ensure that research development strategies will be designed

and implemented for each of the seven challenges chosen in Phase I. These strategies will take a long term view. They will take into account the major evolutionary trends within the scientific fields targeted by the challenges in question.

A steering committee will be formed for each of the seven challenges. Each committee will be made up of five researchers and five representatives from research-result user communities.

The Council prefers to set the focus on questions such as:

- Which research themes have to be developed first in order to help meet the challenges?
- What resources will be needed?
- How can the transfer and exchange of knowledge between the researchers and users be ensured?
- How can exchanges and sustainable collaboration among the researchers from the various areas and disciplines be promoted?

Partnerships

The **STS Perspectives** project enjoys the support of a number of collaborators and partners. The main sponsors were:

- **MEDIE:** The Ministry of Economic Development, Innovation and Exportation, and
- **VRQ:** Valorisation Recherche Québec.

The project also enjoyed the active support of:

- **ACFAS:** Association francophone pour le savoir
- **ADRIQ:** Association des directeurs de la recherche industrielle du Québec
- **FQRNT:** The ‘Fonds québécois de la recherche sur la nature et les technologies’
- **FQRSC:** The ‘Fonds québécois de la recherche sur la société et la culture’
- **FRSQ:** The ‘Fonds de la recherche en santé du Québec’.

Several other ministries and agencies were involved in the execution of Phase II.

Agreements have already been reached with the ministries and agencies that have specific responsibilities linked to the challenges in question. For example The Ministry of Health and Social Services is especially active on Challenges 1 and 2,

The Ministry of Natural Resources, Wildlife and Parks is deeply involved in Challenges 3 and 6, while The Ministry of Employment and Social Solidarity is mainly concerned with Challenges 4 and 7.

The three Quebec grant providers were:

- **FQRSC:** The Quebec Research Fund on Society and Culture,
- **FQRNT:** The Quebec Research Fund on Nature and Technology, and
- **FRSQ:** The Research Fund on Health in Quebec.

In June 2005 they form a partnership with the Council to follow-up on the results of the Foresight. The Research & Development strategies for each of the seven challenges should emerge towards the end of 2006 and throughout 2007.

Cross-Sectoral Collaboration

The **STS Perspectives** project offers the ministries and agencies affected by the challenges in question, the possibility of better orienting and planning their research and innovation initiatives. The three Quebec grant providers have already integrated the **STS Perspectives** challenges into their strategic planning.

To help better understand and find solutions for some of the main challenges that Quebec must address over the next 20 years, strategies will be developed based on collaboration among government interveners, research-sector stakeholders and research users. This exercise is the first of its kind to be carried out for Quebec.

Conclusion

The **STS Perspectives** project constitutes a first use of foresight research as a means of providing food for thought for decision-makers concerning the future of research, science and technology in Quebec. Besides assisting the decision-making process, this project reflects upon the ways in which the general public can participate in key decision making in the future. It is expected that this Foresight-related thinking will continue, and will create other spin-off benefits in the years ahead.

Sources and References

The project website is available at:

<http://www.cst.gouv.qc.ca/LE-PROJET-PERSPECTIVES-Science,384>

About the EFMN: Policy Professionals dealing with RTD, Innovation and Economic Development increasingly recognize a need to base decisions on broadly based participative processes of deliberation and consultation with stakeholders. One of the most important tools they apply is FORESIGHT. The EFMN or European Foresight Monitoring Network supports policy professionals by monitoring and analyzing Foresight activities in the European Union, its neighbours and the world. The EFMN helps those involved in policy development to stay up to date on current practice in Foresight. It helps them to tap into a network of know-how and experience on issues related to the day to day design, management and execution of Foresight and Foresight related processes.