Welcome to this inaugural newsletter of the Council of Canadian Academies. On a regular quarterly basis, the Council News will be a concise and lively way to keep you informed of what we are doing.

This first issue coincides with the end of our first year of regular operation. It has been an eventful 12 months during which we established permanent quarters at 180 Elgin Street in Ottawa; acquired an initial staff of eight (with two more joining us this summer); appointed an eminent Scientific Advisory Committee; and successfully completed our first report - The State of Science & Technology in Canada. The full text of the report can be found on our website, www.scienceadvice.ca, along with a database containing the results of an extensive survey of S&T opinion leaders that was a key input to our assessment.

The launch of the Council was made possible by a $30 million founding grant from the Government of Canada that will support our core operations over 10 years. In consideration of this support, the Council has agreed to undertake up to five expert panel assessments per year on subjects proposed by the government. We have begun work on three such proposals dealing with Canada’s groundwater resources; with nanotechnology; and with the potential of gas hydrates to be a possibly significant source of future energy. (See the article in this issue for details.)

The Council was created as a vehicle to harness the broad, multidisciplinary expertise resident in our three member academies - the Canadian Academy of Health Sciences; the Canadian Academy of Engineering; and the RSC: The Academies of Arts, Humanities and Sciences of Canada. The Council provides the professional staff capability to support assessment of the science that is relevant to important public questions - hence our motto: Science Advice in the Public Interest. Our concept of “science” encompasses not only the natural sciences, but also medicine, engineering, the social sciences and humanities.

What is the Council’s value proposition? It is to efficiently assemble and support the expertise needed to perform credible analysis. Most important is the Council’s independence and objectivity - i.e. the Council is not an arm of government; our expert panels are rigorously selected to reflect a balance of views and to be free from conflicts of interest; and our assessment reports are not subject to change by the sponsor and will always be made quickly available to the public. Independent expertise is thus our hallmark.

The Council is also mandated to provide, in co-operation with our member academies, a voice for Canadians on behalf of the sciences on the national and international scenes. And while we are primarily focused on assessment activity, we have already begun to complement this by developing productive relationships with our counterpart in the US - the National Research Council of the US National Academies - with the Royal Society in the UK and with academies in France, Germany and Sweden.

As you will see elsewhere in this newsletter, the Council is off to an auspicious start. We are determined to build for Canada a new capacity to bring to bear the insights of science on the big issues of our time.

Peter J. Nicholson, President of the Council of Canadian Academies

The inaugural report of the Council of Canadian Academies, The State of Science and Technology in Canada, was published in September 2006 and is available on-line at www.scienceadvice.ca
Three New Assessments Underway

Since the release of our inaugural report, *The State of Science and Technology in Canada*, the Council has received three new proposals from the Government of Canada which focus on groundwater resources, gas hydrates and nanotechnology.

The groundwater proposal, which was developed under the leadership of Natural Resources Canada, asks the Council to assess, from a scientific perspective, what is required to achieve sustainable management of Canada’s groundwater resources. An assessment of the state of knowledge of Canadian groundwater would support informed decision making at the federal and provincial levels, and direct public attention to the value of our present groundwater resources, and possible stewardship challenges.

The second proposal, also developed under the leadership of Natural Resources Canada, asks the Council to assess the potential of gas hydrates to be a possibly significant new energy resource in Canada. A gas hydrate is a geological formation in which a natural gas - typically methane - is embedded at high density within a “cage” of water crystals under conditions of low temperature (e.g. in permafrost) and/or high pressure (e.g. under coastal seabeds). Gas hydrates are believed to contain potentially enormous amounts of fossil energy worldwide but important scientific, engineering, economic and environmental uncertainties need to be better understood before their commercial potential can be fully evaluated. The Council will appoint an expert panel to assess the science and technology that would be needed to safely and profitably extract gas hydrates in Canada.

The third proposal - received officially in early February - was developed under the leadership of Health Canada and focuses on the risks that nanomaterials may pose to human health and the environment. In this case, the assessment will analyse the possible novel risks potentially arising from nanotechnologies. The subject is one of intense activity internationally and this assessment will enable further Canadian engagement in the field.

The Council is currently reviewing each proposal with the sponsoring organizations and identifying panels of experts for each with the advice of the Council’s Scientific Advisory Committee.

The Council in Europe

In mid-February, the Council’s President and Executive Vice-President visited a number of European academies and organizations to expand and deepen the network of international contacts.

Within an eight-day period, Dr. Peter Nicholson and Dr. Marc Saner had a whirlwind of meetings (21 in total) with senior officials of the French Academy of Sciences, the Royal Society, the Union of German Academies and the Berlin-Brandenburg Academy of Sciences, the German Academy of Technical Sciences, and the Royal Swedish Academy of Sciences. The purpose of these meetings was primarily to learn about other academies’ assessment processes and to explore opportunities for collaboration in that regard.

Drs. Nicholson and Saner also met with the Executive Directors of the International Council for Science (ICSU) and the InterAcademy Council (IAC) to learn about and explore opportunities for inter-academy expert assessments on issues of global importance.

Meetings were also held with senior staff at UNESCO and the OECD (including Secretary General Angel Gurría), to discuss the Council’s current assessment topics and possible avenues of co-operation. In keeping with the Council’s objective to communicate its assessments internationally, Dr. Nicholson also delivered an invited presentation on the Council’s first study - *The State of Science and Technology in Canada* - to an international audience at the Science and Technology Policy Research Unit (SPRU), University of Sussex in Brighton, UK.

The Council is grateful for the excellent support of Federal Science Counsellors in particular, Nicolas Dimic of the Canadian Embassy in Paris, and Dr. Henry Mantsch of the Embassy in Berlin.

Drs. Nicholson and Saner would like to thank each of their hosts in Paris, London, Brighton, Berlin and Stockholm for their generous hospitality and support.
Environmental S&T—A Canadian Strength (with Qualifications)

The Council’s first report - *The State of Science & Technology in Canada* - assessed the nation’s strengths across a broad range of S&T fields. Based on an analysis of research publications (“bibliometrics”) and a detailed survey of more than 1,500 senior S&T experts, the report concluded that the broad area of Environmental Science & Technology was one of four main clusters of Canadian strength. This strength was more evident for environmental science research than in the development and application of environmental technologies. Particular sub-areas of Canadian strength included: Physical geography and remote sensing; Geochemistry; Hydrology; Oceanography; Climate science; and Ecology and evolutionary biology. Fuel cells stood out as an area of particular Canadian strength in leading-edge environmental technologies.

Our survey also asked respondents to identify the technologies where they believed Canada could be among world leaders in the next 10 to 15 years. At the top of the list was a cluster of clean energy technologies including renewables, energy recovery technologies, fuel cells, and clean fossil fuels technologies (e.g. CO2 sequestration). The perception of outstanding Canadian opportunity in these areas was one of the clearest results of the survey.

A quite different picture emerged from the expert opinion, recorded elsewhere in the survey. Respondents who judged themselves to be experts in specific subject areas - e.g., various energy technologies - were asked to rate Canada’s standing in those areas on a 7-point scale (with 7 high).

### Sub-areas of Canadian strength in Environmental S&T included:

- Physical geography and remote sensing
- Geochemistry and geochronology
- Hydrology
- Oceanography
- Climate science
- Fuel cells and the hydrogen economy
- Ecology and evolutionary biology

It is evident from the table below that in most of the “green energy” technologies (with the exception of fuel cells) Canada’s capabilities are judged to be quite weak. This assessment appears to be inconsistent with the view that clean energy technology is the area where Canada is best placed to be a world leader in the future. It should be noted that the perception of future opportunity was rated by virtually all of the 1,500 respondents to the survey whereas the assessment of Canada’s strengths in specific energy technologies was rated by a much smaller group consisting only of those who considered themselves to be truly expert in the particular technologies. The forward looking opinion thus probably reflects a strong aspiration that Canada should be a leader in green energy technologies rather than a more narrowly expert assessment of how good we really are at present. In the words of our report “If Canada is to become an international leader in clean energy, there is much work to be done.”

<table>
<thead>
<tr>
<th>Technology Area</th>
<th>Mean score out of 7</th>
<th>Ranking out of 197 sub-areas</th>
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<tbody>
<tr>
<td>Fuel Cells &amp; Hydrogen Technologies</td>
<td>4.87</td>
<td>47</td>
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<tr>
<td>“Clean” Hydrocarbons</td>
<td>4.13</td>
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<tr>
<td>Smart Energy and Conservation</td>
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<td>Energy Cogeneration</td>
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<td>Biofuels</td>
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<td>Wind Power Technologies</td>
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<tr>
<td>Solar Power Technologies</td>
<td>3.40</td>
<td>194</td>
</tr>
</tbody>
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The full report, summary and survey data are available on our website, [www.scienceadvice.ca](http://www.scienceadvice.ca).

**Staff Papers**

The Council will issue occasional staff papers on matters related to our motto “Science Advice in the Public Interest.” The series is kicked off by a paper on *The Changing Nature of Intellectual Authority* by Peter Nicholson. This paper explores the effect of declining deference to traditional authority and the emergence of the Internet as a social medium (“Web 2.0”) on public attitudes towards expertise and on the processes by which we obtain trusted information. In a second paper, Marc Saner provides a Map of the Interface Between Science and Policy to illustrate the relationships between the providers of science advice and the audiences for that advice.

The staff papers are available in both official languages on the Council’s website, [www.scienceadvice.ca](http://www.scienceadvice.ca).
The Council of Canadian Academies And Its Founding Members

The Council of Canadian Academies is a private sector, not-for-profit corporation that is governed by a 12-member Board. Eight governors are appointed directly or indirectly by the Council’s three Member Academies and four are appointed from names suggested by the Minister of Industry on behalf of the Government of Canada.

The founding Members of the Council of Canadian Academies are the following:

**RSC: The Academies of Arts, Humanities and Sciences of Canada**, is the senior national body of distinguished Canadian scientists, scholars and artists. The RSC consists of approximately 1,900 Fellows: men and women from across the country who are selected by their peers for outstanding contributions to the natural and social sciences and in the arts and humanities. The RSC is a charitable organization incorporated by an Act of Parliament in 1883.

The **Canadian Academy of Engineering** is an independent, self-governing and non-profit organization established in 1987. The approximately 375 Fellows of the Academy represent all disciplines of engineering. They are drawn from industry, government and academe and are elected on the basis of their distinguished service and contribution to society, to the country and to the profession.

The **Canadian Academy of Health Sciences** was created in 2004 as successor of the Canadian Institute of Academic Medicine. The CAHS encompasses the full breadth of academic health sciences, including all the medical and allied health sciences ranging from fundamental science to social science and population health. The approximately 220 Fellows currently elected to the CAHS are recognized for their leadership, creativity, distinctive competencies and commitment to the advancement of academic health sciences.

New Addition to the Council

We are pleased to welcome Dr. Trina Foster as the latest addition to the Council staff. Trina joined the Council as a Program Director on February 13, 2007 and has since taken the lead on the Nanotechnology assessment.

Trina double-majored as an undergraduate in Chemistry and Art History at McGill University and completed her PhD in Bioinorganic Chemistry at Boston University (2005). She was a postdoc at Duke University (2005-06) in biochemical and molecular biology particularly related to cell death pathways. Most recently, she has been a Research Associate at the Apoptosis Research Centre affiliated with the Children's Hospital of Eastern Ontario (CHEO).

The arrival of Dr. Foster brings the Council staff to eight.

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