

# What's New at NSERC?

**Engineering Team**

**Canadian Society Meetings  
2008**

# Outline

1. 2008 Federal Budget
2. International Review of Discovery Grants Program
3. GSC Structure Review
4. CREATE
5. 2008 Competition Results
6. Questions and Discussion

# Federal Budget 2008

## Granting Councils (additional \$80M per year)

### ➤ \$34 million per year for NSERC

for collaborative research that directly contributes to the knowledge and innovation needs of Canada's automotive, manufacturing, forestry and fishing industries.

### ➤ \$34 million per year for CIHR

for research that addresses the health priorities of Canadians, including the health needs of northern communities, health problems associated with environmental conditions, and food and drug safety.

### ➤ \$12 million per year for SSHRC

for research that contributes to a better understanding of how the environment affects the lives of Canadians and of the social and economic development needs of northern communities.

# Federal Budget 2008

## ➤ **Canada Graduate Scholarships program**

\$25 million per year to support 500 top Canadian and international doctoral students per year;

## ➤ **Canada Excellence Research Chairs**

\$21 million for 20 new Chairs with each Chair receiving up to \$10 million over seven years;

## ➤ **Canadian Light Source (CLS)**

\$5 million per year, for the next two years, to strengthen its operations;

## ➤ **Indirect Costs of Research**

additional \$15 million per year.

# International Review of DGP - Membership

<b>Peter Nicholson (Chair)</b>	President, Council of Canadian Academies
<b>Sir Graeme Davies</b>	President, University of London
<b>Victoria Kaspi</b>	Professor, McGill University
<b>Larry A. Mayer</b>	Director, Center for Coastal and Ocean Mapping Professor, University of New Hampshire
<b>Kathie Olsen</b>	Deputy Director, National Science Foundation
<b>Alan Robson</b>	Vice-Chancellor, University of Western Australia
<b>Martha Salcudean</b>	Professor Emerita, University of British Columbia
<b>Robert Tibshirani</b>	Professor, Stanford University
<b>Ernst-Ludwig Winnacker</b>	Secretary-General, European Research Council

# International Review of DGP - Methodology

## Reports & Analysis

- Canadian context
- NSERC Context
  - Description of overall suite of programs
  - Detailed analysis of Discovery Grants Program (including “what if” scenario)
- Benchmarking of Canadian R&D performance against other countries (bibliometric analysis)

## Input from key stakeholders

- University administrators
- Scientific/engineering societies
- Individual researchers (online survey + 36 detailed interviews)
- Foreign and Industrial GSC members
- Other stakeholders (from government, industry)

# International Review of DGP - Conclusions

- The DGP is an effective and efficient way to support research
- The attractiveness of the DGP from the researcher's perspective makes Canada more competitive in the competition for talent
- The breadth of support provided by the DGP reflects Canada's regional realities without sacrificing excellence

# International Review of DGP – Conclusions

- The success rate is *not* incompatible with, and in fact encourages, a high degree of research excellence across a broad range of fields
- The best researchers are able to use support of a Discovery Grant to lever an internationally-competitive level of funding from other sources
- The broad base of DGP grants contributes significantly to meeting the nation's needs for research results and HQP
- The DGP is an exceptionally productive investment and deserves additional funding to ensure that the value of its grants keeps pace with the growing opportunity



# International Review of DGP - Recommendations

## **R1: An applicant's previous Discovery Grant should not be the starting point for a new grant.**

- GSCs should rate proposals by merit without reference to prior grants or requested budget
- Assign proposals to “bins” based on merit
- Allocate funds with reference to cost of research and need for funds
- Separately rate and fund proposals for “early career” researchers
- Review selection criteria to include potential of research to be “transformational” and better define the “need for funds” criterion

# International Review of DGP - Recommendations

**R2: Double the number of Discovery Accelerator Supplements to 200 per year, but fund out of new money**

**R3: Revise the Grant Selection Committee structure**

- Cut the number of GSCs about in half – details to be advised by GSC Structure Review Committee
- Roughly double the proportion of non-resident GSC members (to about 15%)
- Ensure that every proposal is reviewed by at least one reviewer from outside Canada

# International Review of DGP - Recommendations

## **R4: Increase support for training highly-qualified personnel**

- Strengthen Canada's ability to attract PDFs from abroad (endorse NSERC's proposed CREATE program)
- Develop ways to encourage Canadian PDFs abroad to return to Canada

## **R5: Increase funding for DGP to ensure that the value of its grants keeps pace with the growing opportunity**

# GSC Structure Review - Membership

<b>Adel Sedra (Chair)</b>	Dean of Engineering, University of Waterloo
<b>Mark Bisby</b>	Previous VP Research, CIHR
<b>Elizabeth Cannon</b>	Dean of Engineering, University of Calgary
<b>Nick Cercone</b>	Dean of Science and Engineering, York University
<b>Patrick Desjardins</b>	Professeur titulaire, CRC, École Polytechnique
<b>Michael Gibbons, MBE</b>	Sussex University; Previous Secretary General, Association of Commonwealth Universities
<b>Peter March</b>	Director, Mathematics Division, NSF
<b>Nils Petersen</b>	Director General, NINT, Edmonton
<b>Susan Pfeiffer</b>	Dean of Graduate Studies, University of Toronto
<b>Mario Pinto</b>	Vice President-Research, Simon Fraser University
<b>Gary Slater</b>	Dean of Graduate Studies, University of Ottawa
<b>Nancy Van Wagoner</b>	Associate VP Research, Thompson Rivers University
<b>Warwick Vincent</b>	Professeur, CRC, Université Laval; NSERC Committee on Grants and Scholarships
<b>Carolyn Watters</b>	Dean of Graduate Studies, Dalhousie University

# GSC Structure Review - Motivation

- Changing research landscape
- Need to provide a rigorous assessment of all proposals, whether
  - purely disciplinary or cross over several fields,
  - areas or a newly emerging fields
- Splitting committees to deal with workload increases the degree of specialization of individual committees, and could exacerbate the preceding problem
- Survey results
  - 31% of the 4,500 respondents believe there are established or emerging areas that are not handled well by the current system

# GSC Structure Review - Principles

Implement a structure and processes that:

- Achieve the objectives of the Program within NSERC's Vision of helping to make Canada a country of discoverers and innovators for the benefit of all Canadians
- Are transparent to applicants and reviewers, and can be easily explained to NSERC stakeholders.
- Are expert, fair and efficient.
- Effectively allocate funding

# GSC Structure Review - Goals

- A grant evaluation structure that is based on a comprehensive analysis of the current research environment
- Protocols that maintain confidence in the Program from the research community
- A dynamic and flexible structure that responds to a changing research environment
- Consistently high quality Committee review of proposals in established as well as new and emerging areas
- In-depth review of all proposals through innovative and flexible processes, while ensuring a manageable workload for Committee members, referees and staff
- Effective communication of exciting Canadian research
- Keeping administration costs reasonable

# GSC Structure Review – Recommendations

The recommendations fall in four categories:

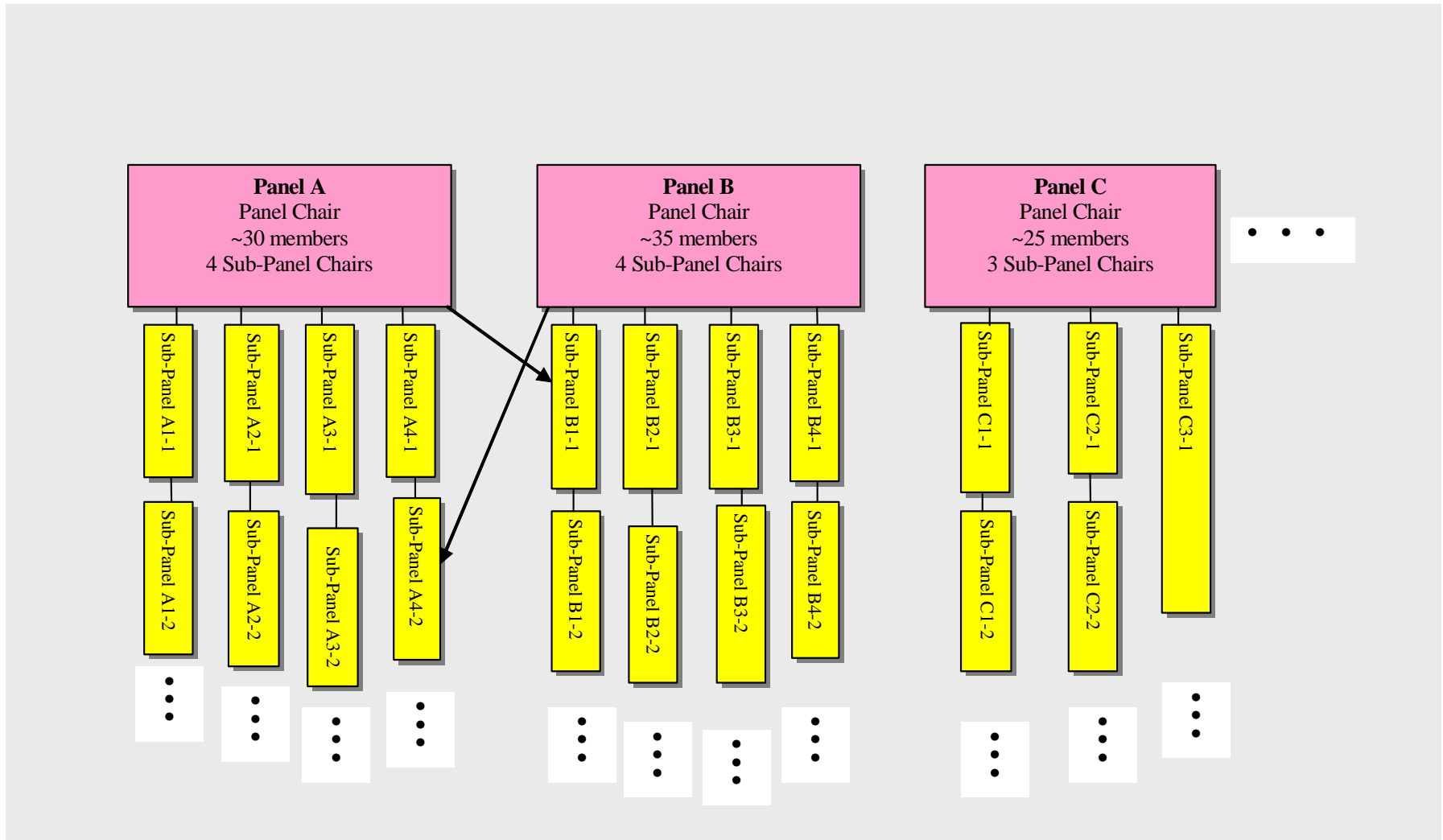
- Structure – the Conference Model
  - Replace the current 28 GSCs by 10-12 Groups
  - Each group to have a number of Sections meeting in three or four parallel streams.
  - The Groups will largely be organized along disciplinary lines.
  - Where it is appropriate for the area (e.g. Environment), thematic sections may be established
- Merit Assessment
- Funding Recommendations
- Periodic review of the system



# Conference Model - Definition

- Is similar to a scientific conference, where several sessions are occurring in parallel streams.
- The conference model has been implemented by four Grant Selection Committees (GSCs) – three years for one GSC – with two streams running in parallel.
- The proposed concept expands the model to three to four streams.
- Members meet in various combinations to assess applications in specific topics.
- Each stream involves six to eight members.

# The Conference Model



# Conference Model – Definition (con't)

- Panel members are assigned to various topic panels on the basis of the match between members' expertise and the subject matter.
- Some topics may be at the interface between two Groups and reviewed by an appropriate combination of members from both Groups.
- The 28 current GSCs are replaced by 10 to 12 Groups (approximately 30 to 35 members).

# Advantages of Conference Model

- Provides a system with increased flexibility to ensure that applications have the best possible review;
- Eliminates the need for consultation process between two GSCs – such applications are reviewed by a joint topic section and benefit from a larger pool of expertise than in the current system;
- Proposals would be discussed by smaller numbers of members
  - reduction of the number of readers and, therefore, a reduction in workload; and
- Enables "traditional" disciplines or well-defined areas to remain together.

# GSC Structure Review – Merit Assessment

## Binning of applications:

- Sections to assess the quality of proposals in terms of a numeric grade according to each of the following criteria:
  - scientific or engineering excellence of the researcher(s);
  - merit of the proposal;
  - contribution to the training of highly qualified personnel
- And:
  - the appropriateness of the budget justification
  - the relative cost of the proposed program of research (low, medium or high) for the topic area
- The ratings on these will then be combined into a numeric grade (merit) and will be qualified by a ‘Cost of Research’ factor

# GSC Structure Review – Funding Recommendations

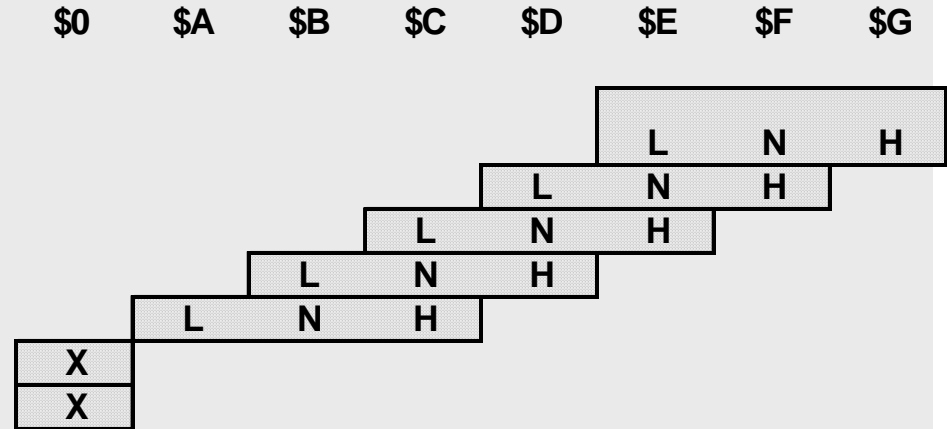
- Allocation to Sections
  - Based on population dynamics (number of researchers) and relative costs of research
- Allocation to Proposals
  - Separation of Scientific Evaluation and Funding Recommendations
  - Executive Committee for each Group will use a grid to translate the recommendations on quality and on cost of research into funding recommendations
    - For low, normal or high costs of research for the area
    - Need to ensure consistency amongst panels
    - Possible implementation in competition 2009

# Funding Scenarios

## EXAMPLE "A" - HIGH COST OF RESEARCH

Rating

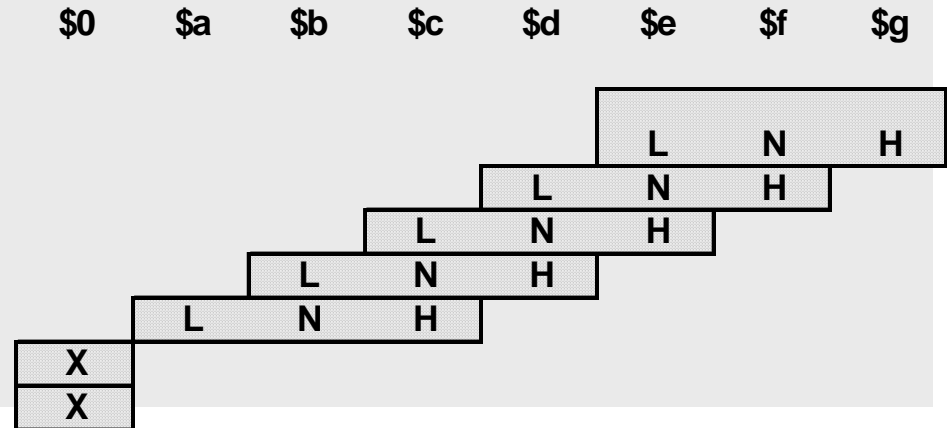
- 1 World class researcher, superb research program, excellent contribution to HQP
- 2
- 3
- 4
- 5
- 6 Lowest fundable quality (if funds available)
- 7 Below quality cut off



## EXAMPLE "B" - LOW COST OF RESEARCH

Rating

- 1 World class researcher, superb research program, excellent contribution to HQP
- 2
- 3
- 4
- 5
- 6 Lowest fundable quality (if funds available)
- 7 Below quality cut off



## **CREATE (Collaborative Research And Training Experience)**

Support the training of teams of outstanding students and PDF through innovative training programs that

- encourage collaborative and integrative approaches, and address significant scientific challenges; and
- facilitate the transition of new researchers from trainees to productive employees in the Canadian workforce.

Encourage one or more of the following

- acquisition and development of important professional skills (complement their qualifications and technical skills);
- student mobility; and
- interdisciplinary research



# CREATE

- Eligibility
  - Teams – the majority of the group must be from NSE fields
  - Focus - on new training initiatives
  - An institution can be lead on a maximum of four applications per competition
- Funding
  - 6 years (year 1, up to \$150K, years 2-6, up to \$300K)
  - Minimum of 80% of funds spent on stipends to HQP
  - Up to 30% of which may be for students not enrolled in NSE fields

# CREATE

- Selection Criteria
  - Merit of the proposed training program (40%)
  - Excellence of researchers (40%)
  - Program management and long-term sustainability (20%)
- Application process
  - Notification of Intent – July 15
  - Full Application – September 15
    - including 3 reports from referees

# 2008 Discovery Grants Competition Results\*

---

*\* Non-official results. Official results are to be posted on NSERC Web site shortly.*

# Highlights of 2008 Competition

- Difficult budget situation this year for all
- Increasing number of applications not matched by corresponding budget increase
- Budget insufficient to meet needs of applicants
- GSCs have set minimum grants – avg. of \$17K.

# 2008 Competition Results - Overall

## Discovery Grants

	New Applicants	Renewal Applicants	Overall
Success Rate	62%	73%	71%
Average Grant	\$23,160	\$31,330	\$29,818

## Research Tools & Instruments

Success Rate = 37%

Funding Rate = 33%

Average Grant = \$64,662

# All Applicants – Engineering GSCs

Grants Selection Committee (GSCs)	ALL APPLICANTS		
	No. app.	% Success	Avg. Grant (\$)
(04) Chemical & Metallurgical Eng.	219	81%	27,095
(20) Industrial Eng.	90	63%	21,107
(334) Comm., Comp. & Components Eng.	114	80%	28,074
(335) Electro. & Elect. Syst. Eng.	96	71%	29,694
(1053) Mechanical Eng. - A	130	69%	22,315
(1054) Mechanical Eng. – B	92	70%	26,175
(1061) Civil Engineering - A	112	63%	25,919
(1062) Civil Engineering - B	87	69%	23,785
<b>SUB-TOTAL (engineering) 2008</b>	<b>940</b>	<b>72%</b>	<b>25,851</b>
<b>TOTAL (all GSCs) 2008</b>	<b>3405</b>	<b>71%</b>	<b>29,818</b>
<b>SUB-TOTAL (engineering) 2007</b>	<b>961</b>	<b>71%</b>	<b>24,910</b>
<b>TOTAL (all GSCs) 2007</b>	<b>3592</b>	<b>70%</b>	<b>29,443</b>

# FTAs & Returning - Engineering GSCs

Grants Selection Committee (GSCs)	First-time Applicants			Returning		
	No. app.	% Success	Avg. Grant \$	No. app.	% Success	Avg. Grant \$
(04) Chemical & Metallurgical Eng.	36	81%	23,953	183	81%	27,710
(20) Industrial Engineering	21	48%	17,600	69	68%	21,854
(334) Comm., Comp. & Components Eng.	23	78%	20,920	91	80%	29,838
(335) Electro. & Elect. Syst. Engineering	26	69%	23,877	70	71%	31,789
(1053) Mechanical Engineering – A	33	52%	18,706	97	74%	23,167
(1054) Mechanical Engineering – B	22	55%	21,708	70	74%	27,206
(1061) Civil Engineering – A	21	67%	20,129	91	63%	27,341
(1062) Civil Engineering – B	16	63%	18,500	71	70%	24,842
<b>SUB-TOTAL (Engineering) 2008</b>	<b>198</b>	<b>65%</b>	<b>20,700</b>	<b>742</b>	<b>74%</b>	<b>26,700</b>
<b>TOTAL (All GSCs) 2008</b>	<b>721</b>	<b>62%</b>	<b>23,160</b>	<b>2,684</b>	<b>74%</b>	<b>31,330</b>
<b>TOTAL Engineering 2007</b>	<b>271</b>	<b>56%</b>	<b>20,325</b>	<b>690</b>	<b>76</b>	<b>24,976</b>

# Research Tools & Instruments

Grant Selection Committees	No. of Applic.	\$ Req. (\$million)	Success Rate	Funding Rate
(04) Chem. & Met. Eng.	155	\$13.9	34%	33%
(20) Industrial Engineering	6	\$0.5	44%	34%
(334) Comm., Comp & Components Eng.	44	\$3.6	34%	34%
(335) Electro. & Elect. Syst. Eng.	65	\$4.9	36%	34%
(1053) Mechanical Eng. – A	90	\$6.3	32%	33%
(1054) Mechanical Eng. – B	61	\$4.6	36%	33%
(1061) Civil Engineering – A	46	\$3.6	37%	31%
(1062) Civil Engineering - B	49	\$3.3	41%	31%
<b>Sub-Total (engineering)</b>	<b>517</b>	<b>\$40.6</b>	<b>37%</b>	<b>33%</b>
<b>Total (all GSCs)</b>	<b>1582</b>	<b>\$113.1</b>	<b>37.6%</b>	<b>32.9%</b>



# DAS - 2008 Competition

Engineering GSCs	Quota		Awarded	
	Regular	Targeted	Regular	Targeted
(04) Chem. & Metallurgical Eng.	8	8	2	3
(20) Industrial Engineering	2	3	0	1
(1053) Mechanical Engineering – A	3	2	1	1
(1054) Mechanical Engineering – B	3	4	0	2
(1061) Civil Engineering – A	3	3	2	3
(1062) Civil Engineering – B	2	5	0	6
<b>Sub-Total (Engineering)</b>	21	25	5	16
<b>Total for All GSCs</b>	100	100	32	68



**UN EXCELLENT PÔLE DE RECHERCHE  
A COOL PLACE TO DO RESEARCH**