

2nd Annual Researcher's Meeting

**Panel 3.2 – Green Economy as a
Successful Model for Innovation in
Industrialized Countries – CANADA**

Berlin, September 20th, 2010
David McLaughlin, NRTEE



Table of Contents



1. About Us

National Round Table on the Environment and the Economy

2. Climate Prosperity Program

Low-carbon Economy Stream

3. Benchmarking Low-Carbon Performance

Report: Measuring Up: Benchmarking Canada's Competitiveness in a Low-Carbon World

4. Low-Carbon Growth Plan

Report: Canada-U.S. Climate Policy Study

Report: Policy Pathway for Global Low-Carbon Transition



About the Round Table

(National Round Table on the Environment and the Economy - NRTEE)

Created in 1988

Formalized by Parliament in 1993 statute

Only national public policy body mandated to study environment and economy together

Arms-length from government with independent role and mandate

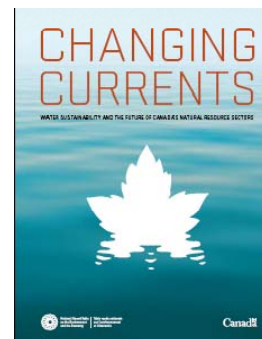
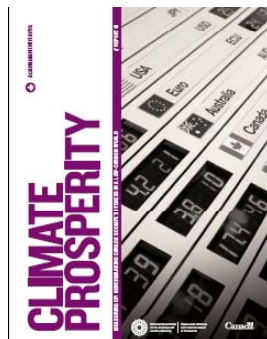
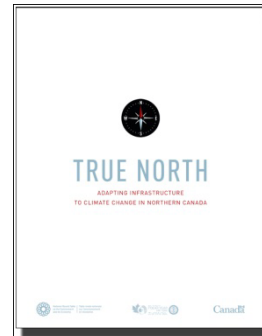
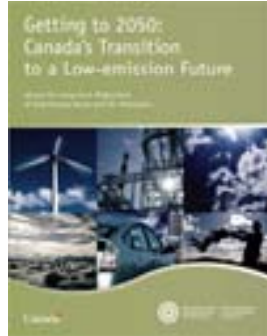
Catalyst, convener and advisor for sustainable development solutions -

15 appointed members: business, sustainability, labour, academe, and public service





Recent NRTEE Work



- **Getting to 2050: Canada's Transition to a Low-emission Future**
- **Geared for Change: Energy Efficiency in Canada's Commercial Building Sector**
- **Achieving 2050: A Carbon Pricing Policy for Canada**
- **True North: Adapting Infrastructure to Climate Change in Northern Canada**
- **Measuring Up: Benchmarking Canada's Competitiveness in a Low-Carbon World**
- **Changing Currents: Water Sustainability and the Future of the Canada's Natural Resources Sectors**

CLIMATE PROSPERITY

A CANADIAN INITIATIVE



THIS IS NOT JUST ABOUT
COPING WITH CLIMATE CHANGE,
BUT **PROSPERING** THROUGH IT.

Aims



- Provide insight and policy advice on both the economic risks *and* opportunities of climate change for Canada
- Shift the debate
 - from risk to opportunity, cost to investment
 - from not just about coping with climate change, but prospering through it
- Provide advice to governments on what they can do to prepare and secure Canada's future in a climate-changing world

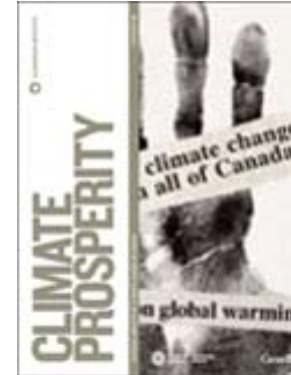
The Timeline



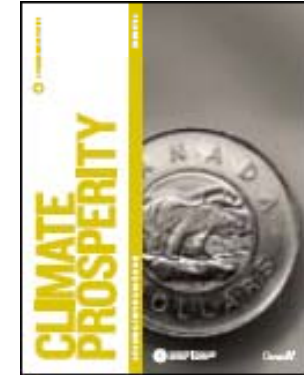
Report 01 // Benchmarking Canada's Competitiveness in a Low-Carbon World



Report 02 // Canada-U.S. Climate Policy Study



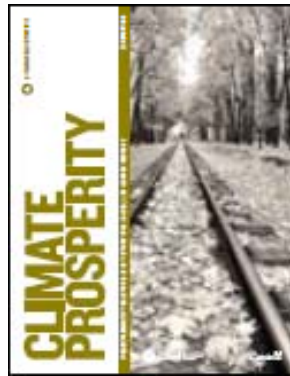
Report 03 // Physical Impacts of Climate Change in Canada



Report 04 // Net National Costs of Climate Change



Report 05 // Policy Pathway Report for Climate Impacts and Adaptation



Report 06 // Policy Pathway Report for Global Low-Carbon Transition



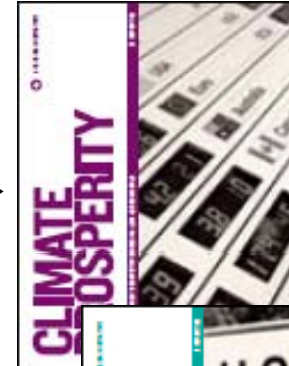
Report 07 // Citizen Engagement



Sequence of Reports – Low-Carbon Economy Stream



How does Canada's low-carbon performance compare to others?



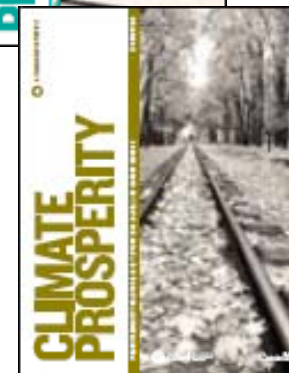
Spring 2010

What climate policy options are best for Canada-U.S. harmonization?

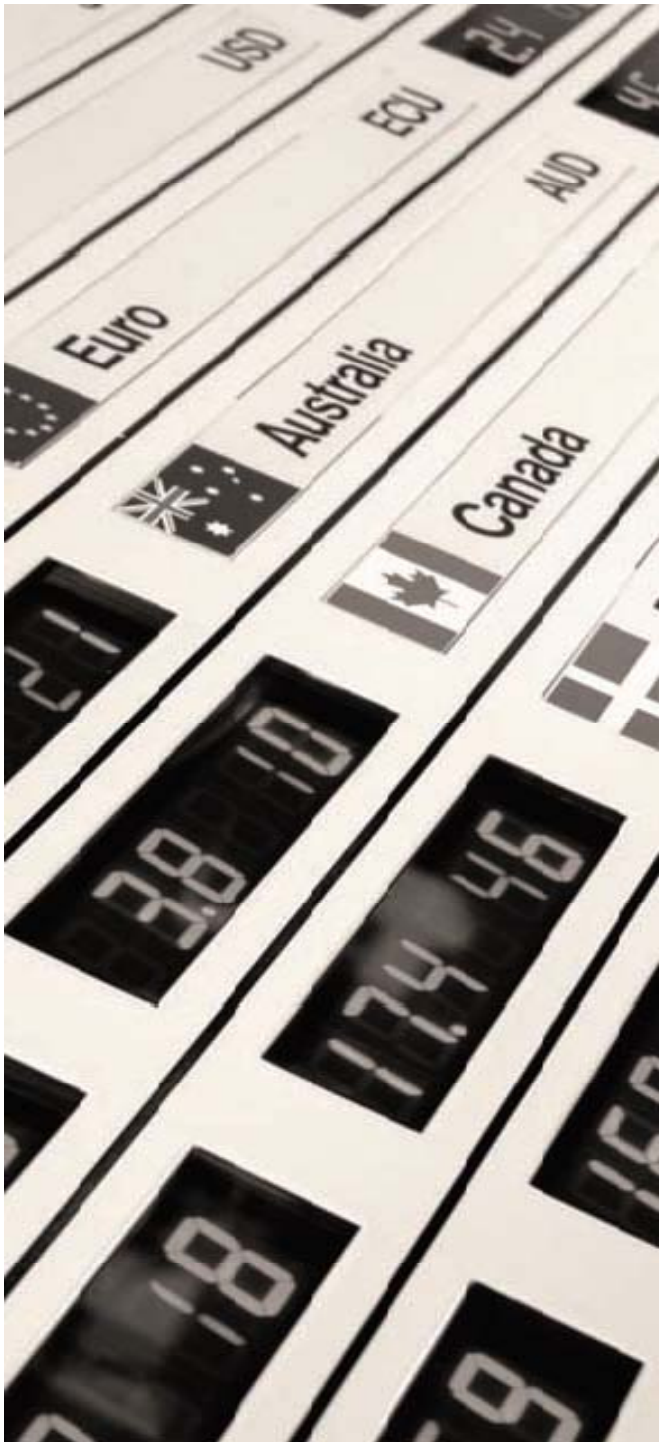


Fall 2010

What does a low-carbon growth plan for Canada look like?



Fall 2011



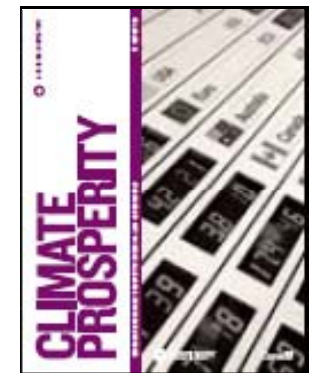
Measuring Up: **Benchmarking Canada's** **Competitiveness in a Low-** **Carbon World**

This report assesses Canada's capacity to be competitive in a new global low-carbon economy, by comparing it to other G8 nations in areas such as emissions and energy, skills, investment, innovation and governance.

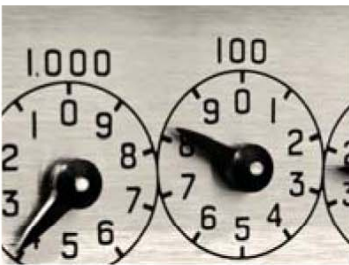




Measuring Up: Benchmarking Canada's Competitiveness in a Low-Carbon World



- The LCPI benchmarks Canada to the G8 economies in a variety of performance categories deemed important to reducing carbon emissions while also fostering economic growth and prosperity.
- It compares Canada's performance separately with China, Australia, and Norway.
- Equal number of indicators per category
- All indicators are forward-looking for building capacity.



NRTEE LOW-CARBON PERFORMANCE INDEX

EMISSIONS & ENERGY	INNOVATION	SKILLS	INVESTMENT	POLICY & INSTITUTIONS
				
CARBON PRODUCTIVITY	LOW-CARBON ENERGY PATENTS	SUSTAINABILITY MBA PROGRAMS	CLEAN TECHNOLOGY INITIAL PUBLIC OFFERING (IPO)	LOW-CARBON GROWTH PLAN
EMBODIED CARBON EMISSIONS IN EXPORTS	ENERGY SECTOR BUSINESS EXPENDITURE ON R&D	LOW-CARBON PROGRAM GRADUATES	CLEAN TECHNOLOGY VENTURE CAPITAL	GREENHOUSE GAS TARGETS AND ACCOUNTABILITY
LOW-CARBON ELECTRICITY	GOVERNMENT EXPENDITURE ON LOW-CARBON ENERGY R&D	SPENDING ON POST-SECONDARY EDUCATION	LOW-CARBON STIMULUS SPENDING	CARBON PRICE COVERAGE AND STRINGENCY

Energy and emissions profile in order to assess national performance and direction on moving to low-carbon energy production and use.

R&D and technology profile in order to assess national performance and capacity on low-carbon energy technology innovation.

Post-secondary graduate profile in order to assess national performance and capacity on investing and developing a skilled and relevant workforce needed for a low-carbon transition.

Spending in clean technology and low-carbon stimulus in order to assess national performance and capacity on readiness and commitment for low-carbon transition.

Governance mechanisms and plans in order to assess national performance and institutional capacity and policy approaches to both manage and adapt to a low-carbon economic transition.


Overall Ranking of G8 Countries by Category and Tier











	OVERALL	EMISSIONS & ENERGY	INNOVATION	SKILLS	INVESTMENT	POLICY & INSTITUTIONS	NORMALIZED FINAL SCORE
TIER 1 (AVERAGE SCORE: 53 POINTS)							
France	1	1	4	3	1	4	58
Germany	2	5	2	2	3	2	52
United Kingdom	3	4	6	5	5	1	48
TIER 2 (AVERAGE SCORE: 40 POINTS)							
Japan	4	2	1	8	7	5	43
United States	5	3	5	4	2	7	40
Canada	6	6	3	1	4	6	38
TIER 3 (AVERAGE SCORE: 17 POINTS)							
Italy	7	7	7	6	6	3	27
Russia	8	8	8	7	8	8	7

How Canada Ranks

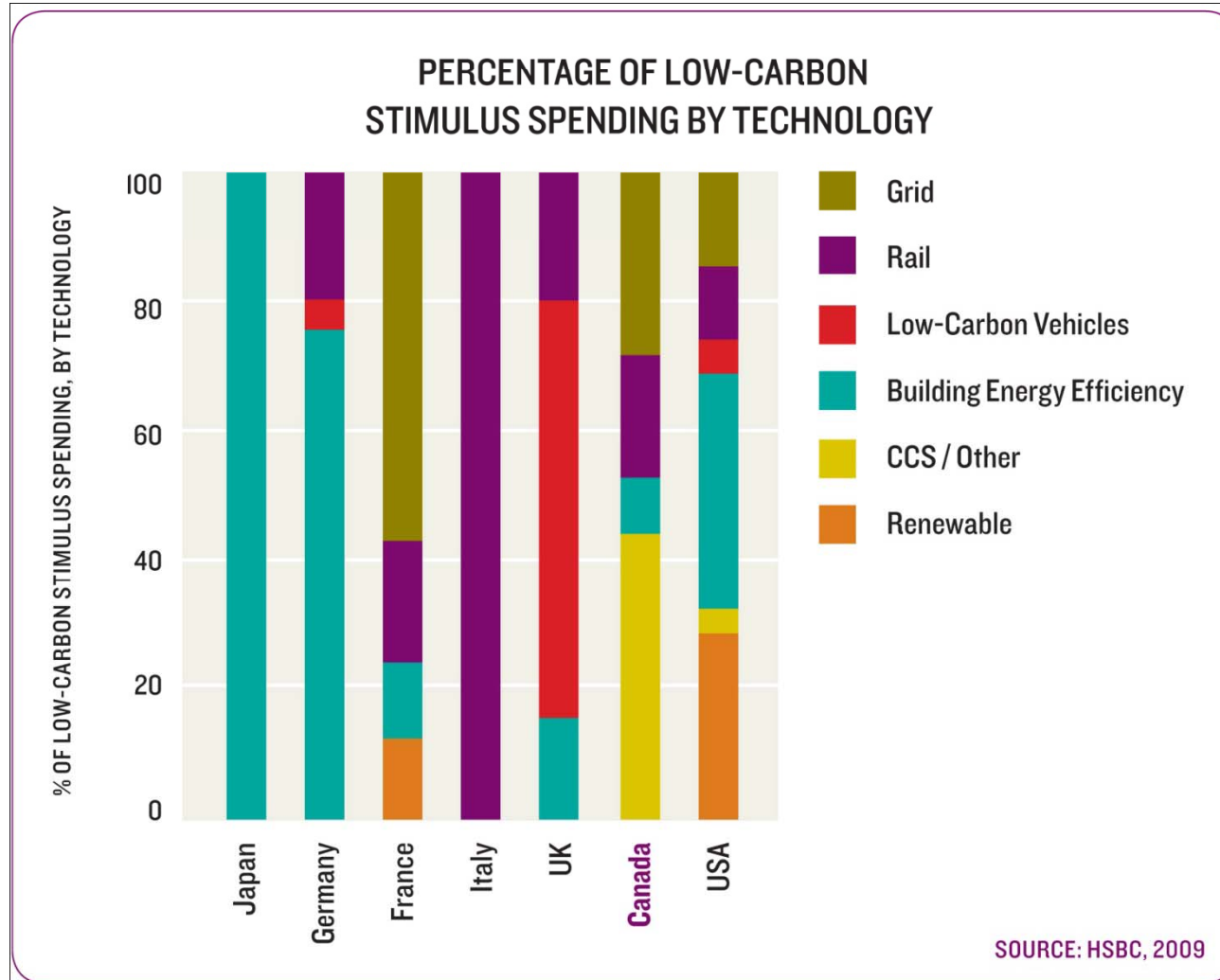


	 1 ST SKILLS	3 RD INNOVATION	4 TH INVESTMENT	6 TH EMISSIONS & ENERGY	6 TH POLICY & INSTITUTIONS
In the top 3 INDICATORS	TWO INDICATORS <ul style="list-style-type: none"> • Sustainability MBA programs (2nd) • Spending on post-secondary education (1st) 	ONE INDICATOR <ul style="list-style-type: none"> • Government expenditure on low-carbon energy R&D (3rd) 	ONE INDICATOR <ul style="list-style-type: none"> • Clean technology venture capital (3rd) 	ONE INDICATOR <ul style="list-style-type: none"> • Low-carbon electricity (2nd) 	NONE
In the bottom 3 INDICATORS	ONE INDICATOR <ul style="list-style-type: none"> • Low-carbon program graduates (7th) 	ONE INDICATOR <ul style="list-style-type: none"> • Energy sector business expenditure on R&D (6th) 	NONE	TWO INDICATORS <ul style="list-style-type: none"> • Carbon productivity (7th) • Embodied carbon in exports (8th) 	ONE INDICATOR <ul style="list-style-type: none"> • GHG targets and accountability (5th)*

LEADERS BY CATEGORY AND TOP 3 INDICATOR RANKING

	OVERALL	CATEGORY		INDICATOR	
		LEADER	IN TOP 3 (EXCLUDING LEADER)	LEADER	IN TOP 3 (EXCLUDING LEADER)
 France	1	<ul style="list-style-type: none"> Emissions & Energy Investment 	<ul style="list-style-type: none"> Skills 	<ul style="list-style-type: none"> Carbon productivity Low-carbon electricity Cleantech IPOs Low-carbon stimulus spending 	<ul style="list-style-type: none"> Government - Low-carbon energy R&D Low-carbon program graduates Spending on post-secondary education GHG targets & accountability*
 Germany	2	None	<ul style="list-style-type: none"> Innovation Skills Investment Policy & Institutions 	<ul style="list-style-type: none"> Low-carbon program graduates Carbon price coverage & stringency 	<ul style="list-style-type: none"> Low-carbon electricity Low-carbon energy patents Energy sector R&D Spending on post-secondary education Cleantech IPOs Low-carbon stimulus spending GHG targets & accountability*
 United Kingdom	3	<ul style="list-style-type: none"> Policy & Institutions 	None	<ul style="list-style-type: none"> GHG targets & accountability Low-carbon growth plan 	<ul style="list-style-type: none"> Carbon productivity Embodied carbon in exports Low-carbon energy patents Sustainability MBA programs Cleantech venture capital Carbon price coverage & stringency
 Japan	4	<ul style="list-style-type: none"> Innovation 	<ul style="list-style-type: none"> Emissions & Energy 	<ul style="list-style-type: none"> Low-carbon energy patents Energy sector R&D Government - Low-carbon energy R&D Low-carbon growth plan 	<ul style="list-style-type: none"> Embodied carbon in exports
 United States	5	None	<ul style="list-style-type: none"> Emissions & Energy Investment 	<ul style="list-style-type: none"> Embodied carbon in exports Sustainability MBA programs Cleantech venture capital 	<ul style="list-style-type: none"> Energy sector R&D Cleantech IPOs Low-carbon stimulus spending
 Canada	6	<ul style="list-style-type: none"> Skills 	<ul style="list-style-type: none"> Innovation 	<ul style="list-style-type: none"> Spending on post-secondary education 	<ul style="list-style-type: none"> Low-carbon electricity Government - Low-carbon energy R&D Sustainability MBA programs Cleantech venture capital
 Italy	7	None	<ul style="list-style-type: none"> Policy & Institutions 	None	<ul style="list-style-type: none"> Carbon productivity GHG targets & accountability* Carbon price coverage & stringency
 Russia	8	None	None	None	<ul style="list-style-type: none"> Low-carbon program graduates

“Green” Stimulus Investment





Canada-U.S. Climate Policy Study

This report will examine the environmental and economic implications of uncertain U.S. climate policy for Canadian climate policy choices.

Canada-U.S.: Climate Policy Study



- To assess the implications of uncertain U.S. climate and domestic climate policy choices for Canada.
- To identify policy options and trade-offs for Canada to achieve its 2020 emission reductions target, while managing risks for Canada of adverse national, regional, and sector-level impacts from both potential U.S. and domestic policy choices





The U.S. Market for Canadian Energy Goods

“Canada is the United States’ largest and most secure supplier of oil, natural gas, electricity and uranium.”

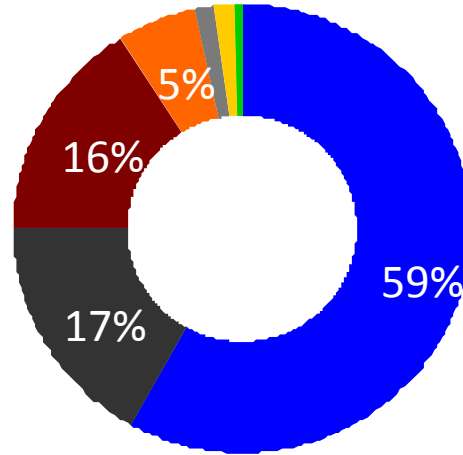
- **Canada provided energy exports to the U.S. valued at \$122 billion, while Canada’s energy imports from the U.S. totalled almost \$16 billion.**
- **Recent data indicates that Canada supplies the U.S. with 9% of its total energy demand.**

Source (Government of Canada, 2008 Data)

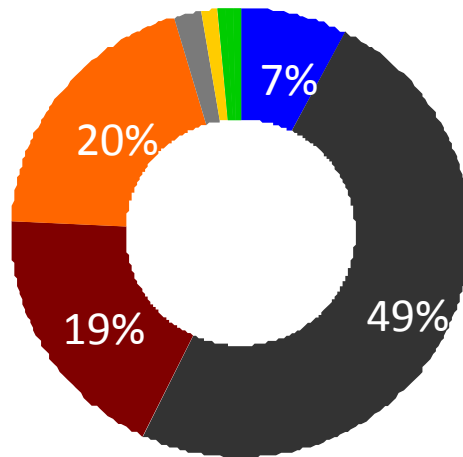


Canada – U.S. Electricity Difference

Canada



United States

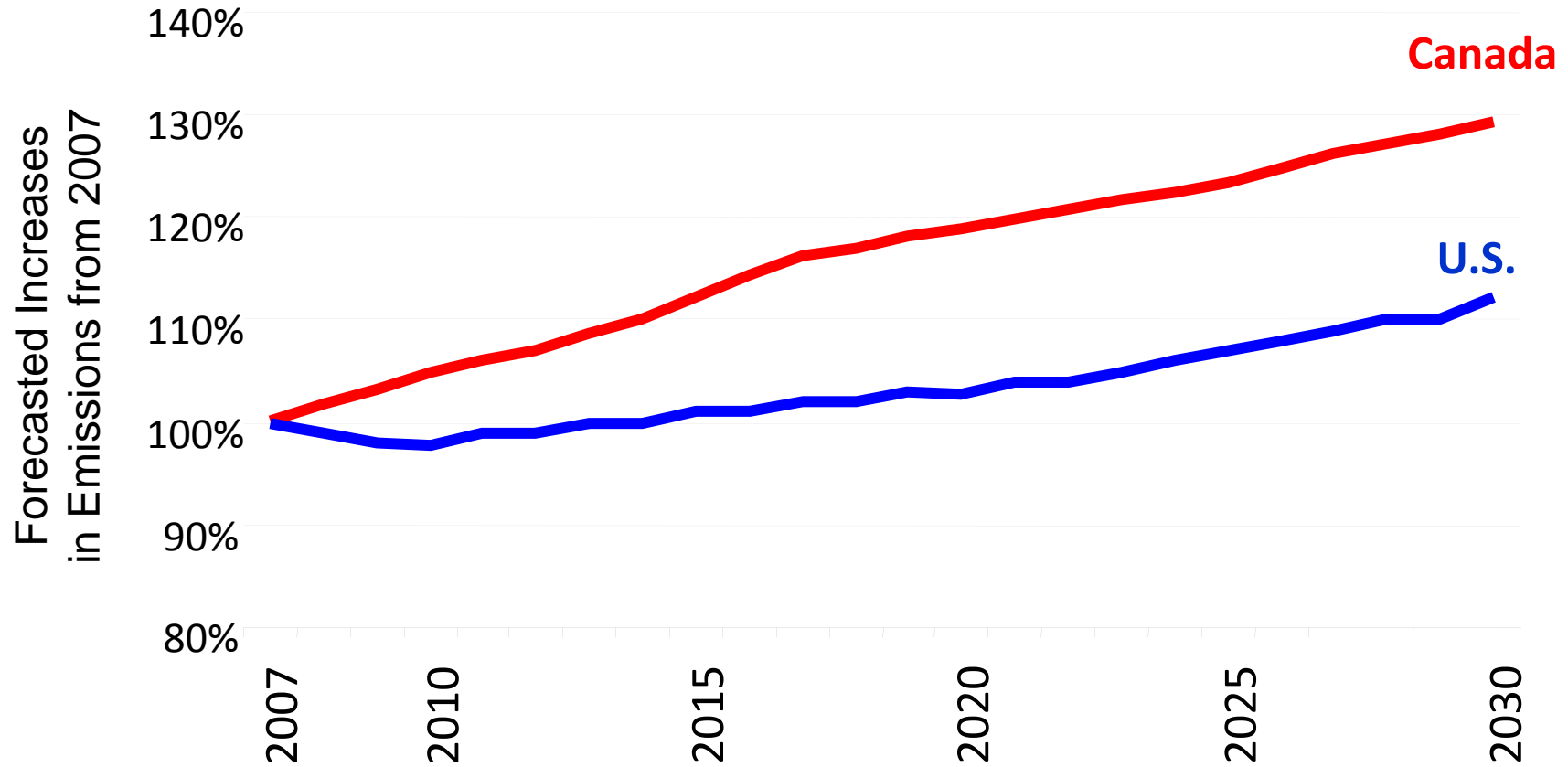


- hydro
- coal
- nuclear
- gas
- oil
- biomass
- other sources (wind, tide, solar PV, waste, geothermal, solar thermal, other)



Canada-U.S. GHG Difference

Business as Usual emissions growth forecasts





Risks for Canada: Four Key Scenarios

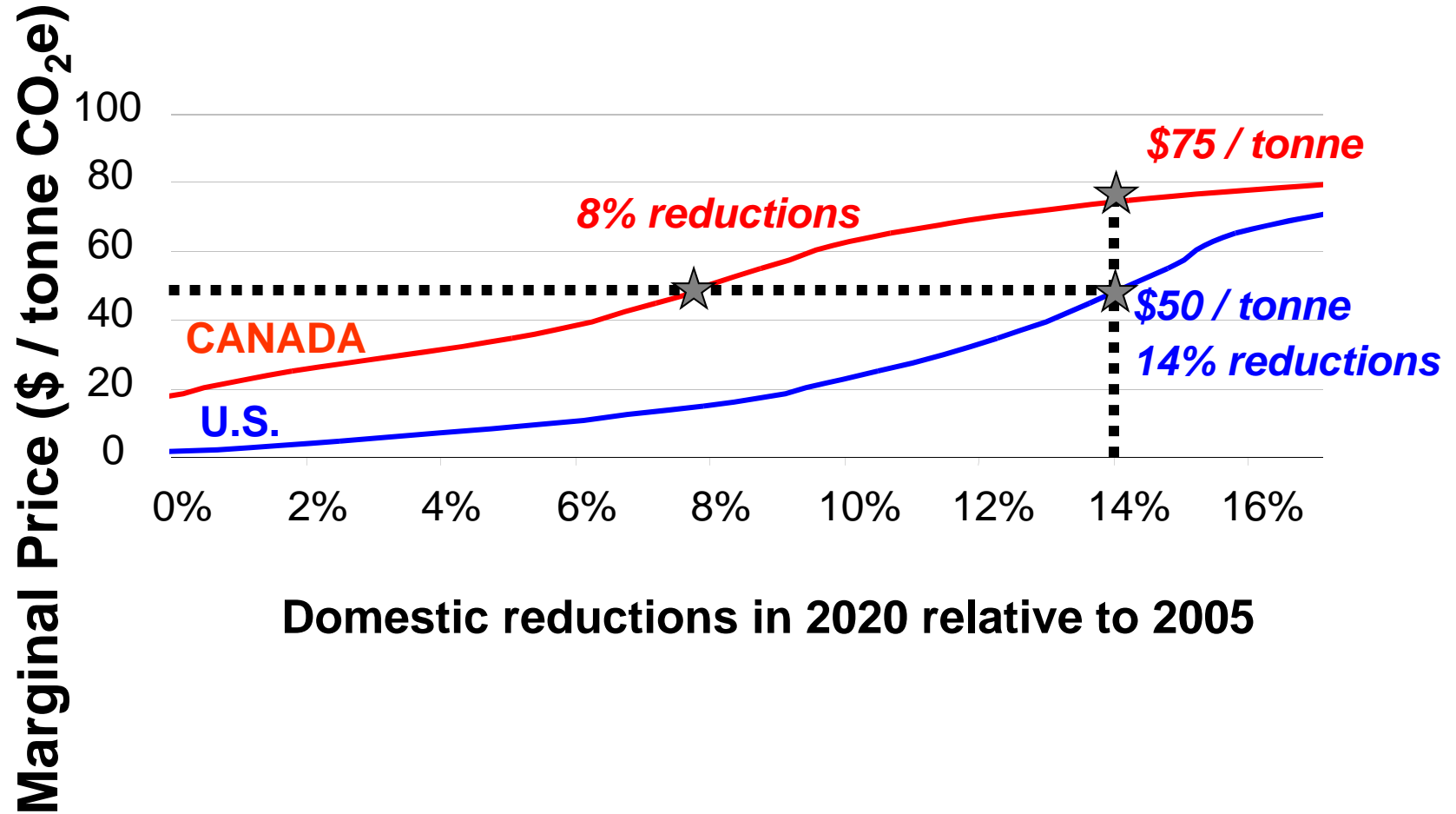
Policy in Canada

Policy in U.S.

Canada Lags	No policy in Canada	U.S. implements cap-and-trade system to achieve 17% reductions below 2005 by 2020
Canada Leads	Canada implements cap-and-trade system to achieve 17% reductions below 2005 by 2020	No policy in U.S.
Canada Harmonizes on targets	Canada implements cap-and-trade system to achieve 17% reductions below 2005 by 2020	U.S. implements cap-and-trade system to achieve 17% reductions below 2005 by 2020
Canada Harmonizes on carbon prices	Canada implements cap-and trade system with carbon price that matches the U.S.	U.S. implements cap-and-trade system to achieve 17% reductions below 2005 by 2020

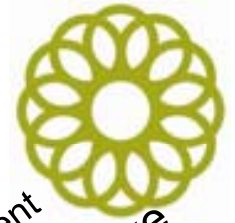


The Issue: Challenges of Harmonizing



Domestic reductions in 2020 relative to 2005

Risks of Leading, Lagging, and Harmonizing



Competitiveness Distributional Market access Low-carbon transition Target achievement Cumulative emissions

Lead

Lag

Harmonize on Targets

Harmonize on Price

Moderate	High	Very low	Very low	Very low	Very low
Very low	Very low	Moderate	High	High	High
Moderate	High	Very low	Very low	Very low	Very low
Very low	Moderate	Low	Low	Moderate	Low

Economic Risks

Environmental Risks



Key Findings and Messages

- **Delaying Canadian policy is still costly**
 - Delay makes achieving targets more expensive and leaves Canada less prepared for a global low-carbon economy
- **Competitiveness risks are real for some sectors,**
 - But they can be addressed; what the U.S. does and how it differs from Canada is less important to industry than the choices Canada makes to decarbonize its own economy
- **Harmonization is challenging**
 - Canada can't easily match U.S. policy both in terms of carbon price and emissions reductions targets

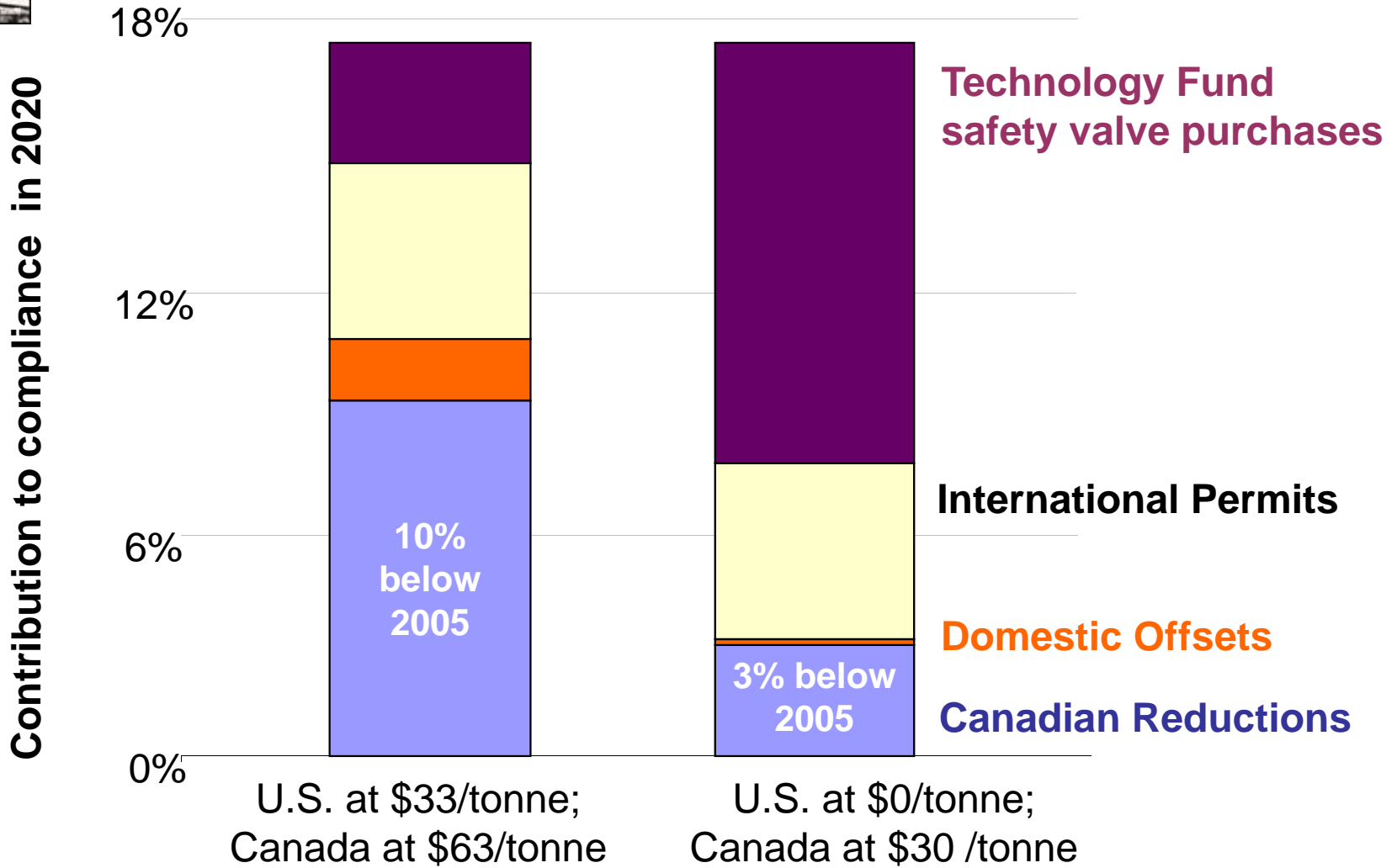


NRTEE Transitional Policy Approach

- 1. Contingent carbon pricing**
 - To keep Canadian carbon prices reasonable and aligned with U.S. as much as possible
- 2. National cap and trade system**
 - With auctioning revenue recycling to address regional and sectoral concerns
- 3. International permits and domestic offsets**
 - To keep Canadian carbon prices lower
- 4. Technology fund**
 - To keep domestic carbon prices lower, align prices close to the U.S., and begin to invest in medium and long-term reductions



Outcomes of the Policy Approach: Emissions Reductions & Compliance





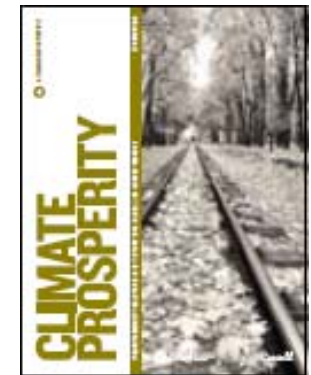
Policy Pathways Report for Global Low-Carbon Transition

Building on previous reports in the series, this advisory report will provide policy pathways and actions necessary for Canada to thrive in a global low-carbon economy in areas such as energy, innovation, skills, investment, and governance

Low-Carbon Transition Landscape in Canada



- Resource and emissions intensive economy
- Global economic crisis has been less acute in Canada compared to other countries; low-carbon investment, innovation and green jobs has not been a focus of stimulus spending
- No federal low-carbon transition plan
- Harmonized GHG targets (17% below 2005 levels in 2020) and vehicle standards with the U.S.
- No national carbon pricing regime (tax or cap-and-trade) in place
- Newly-announced regulations to phase-out coal-fired electricity plants and renewable content of fuel standards
- Primary initiatives relate to funding renewable energy projects and low-carbon innovation
- Considerable action at provincial and municipal level:
 - four provinces as signatories to Western Climate Initiative;
 - carbon tax in B.C. and Quebec;
 - low-carbon industrial policy in Ontario (e.g. Samsung)
 - municipal climate action (FCM's Partners for Climate Protection)



Elements of Low-Carbon Growth Plans Studied



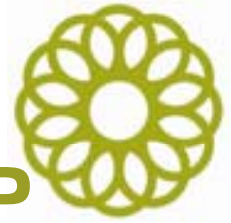
- A description of a nation's development goals, climate vulnerability, and GHG inventory
- A long-term vision for a low-emissions economy that's resilient to climate change
- Cost curves that explain where the mitigation potential lies, and at what price
- Mitigation plans that compare BAU in key sectors with the low-carbon trajectory
- Critical policy levers to promote clean energy, improve efficiency and de-carbonize specific sectors
- Plans for infrastructure investments that distinguish what a nation could finance on its own from what it could achieve only with international assistance
- Macroeconomic modelling to gauge impacts on jobs, GNP, and international competitiveness

Potential Elements to the NRTEE's LCGP



- Identify current and future domestic and global low-carbon opportunities for Canada
- Develop policy in low-carbon innovation, investment, skills, energy and governance to take advantage of identified opportunities
- Determine Canada's competitive advantage in low-carbon goods and services
- Examine current policy frameworks for Canadian markets and how they hinder or promote low-carbon innovation (e.g. subsidies, regulations, taxes)
- Analysis of regional and and distributional issues of a low-carbon transition
- Policy roadmap/recommendations on actions Canada needs to take to position itself for global low-carbon competitiveness

Potential Challenges to Developing a Canadian LCGP



- **Research Based:**

Identification of appropriate scientific and “policy utility” research approach to modelling scenarios and data-use.

- **Policy Based:**

Integration with current economic strategies vs. new transformational strategy.

- **Society Based:**

Low-carbon society vs. low-carbon economy:
Citizens views on the need and willingness to change.

 A CANADIAN INITIATIVE

CLIMATE PROSPERITY

// THE ECONOMIC RISKS AND OPPORTUNITIES OF CLIMATE CHANGE FOR CANADA

www.nrtee-trnee.ca



Natural Resources Canada
in the Government
and the Economy

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