

# ***Value for Canada***

## The cost versus benefit to Canadians of the National Shipbuilding Strategy

### ***Executive Summary***

***For full report visit:***  
*[ShipsforCanada.ca/  
NSSValueforCanada](http://ShipsforCanada.ca/NSSValueforCanada)*

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# Foreword

*The principal conclusion that it is cheaper to build these ships in Canada should come as no surprise in view of the size and duration of this program.*



**Professor P G Wrobel**

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University College London

The Canadian Surface Combatant will be Canada's largest Naval program for a generation. Its successful delivery to performance, price and program are essential to the RCN, Canadian industry and Canadian taxpayers.

This report provides valuable insights into the scale of the benefits to the Canadian economy expected from this program. It is evident that PwC have drawn on a wide range of subject matter experts to produce this professional and impartial report, which I believe is based on credible sources and assumptions.

The difficulties of managing a program of this size and duration should not be under-estimated, whether building in Canada or overseas with Canadian oversight. Predicting long term future costs and benefits for a program such as this is a challenge and sensible sensitivity analysis is included.

Delivering the anticipated economic benefits to Canada of the offset program and managing the foreign exchange risk on a program of this scale will be a challenge. These risks are significantly bigger if the fleet is built overseas.

The principal conclusion that it is cheaper to build these ships in Canada should come as no surprise in view of the size and duration of this program (up to 15 ships built over 25 years), as well as the Halifax investment in facilities and people for the AOPS project.

There are also wider issues such as the sustainment of National Capabilities which should also be considered. Serious Navies ensure that they possess and cultivate the 'core' abilities to deliver, operate and maintain effective and safe warships. There can be a premium to pay for this National capability sustainment, however for this program this is not required since the option to build in Canada is clearly more economic.

The CSC program represents an opportunity for Canada. A successful program is one where the best from across the country is combined with overseas capabilities to give Canada the 'leg up' needed to develop the expertise required to sustain these ships across their operational lives.

Whatever policy choices are made it is not credible to eliminate all of the risks in the early phases of such a program. An ongoing, active process to manage the risks is key to the program's success.

I am pleased to fully endorse the report and its conclusions.



*These three factors, economic benefit, fiscal benefit, cost competitiveness make the choice evident. The federal government is investing in combat ships on behalf of Canadians, and Canadians would benefit on all fronts from having the ships built at home.*



**Pedro Antunes**

Deputy Chief Economist,  
The Conference Board of Canada

This study compares the economic benefit to Canadians of building Canada's next generation of combat ships at home versus building them abroad.

The results are intuitive. Shipbuilding is big and labour intensive. Building combat ships in Halifax rather than abroad will directly employ Nova Scotians and Canadians. Shipbuilding activities will drive demand across the supply chains – helping to lift employment and profits across a wide range of local and national industries. The direct and indirect lift to employment will bolster household income and spending and results in a subsequent round of economic activity – referred to as induced effects.

The economic impact analysis clearly demonstrates the significant net economic benefit that is accrued in Canada if the ships are built in Canada rather than abroad. The fiscal benefits are also intuitive – governments tax economic activity – if the combat ships are built in Canada, federal, provincial and local levels of government will reap the benefits.

Most interesting (and perhaps less intuitive) is the issue of cost. Should the federal government look abroad for less costly construction? Here too the authors carefully evaluate the relative costs of building at home versus building in other jurisdictions. The findings are very interesting – costs are lower if the ships are built in Canada. The long-term nature of the contract – to build 15 combat ships over a period of more than 25 years – will help ensure that investments in capital and people are made across the supply chain to make shipbuilding in Canada cost competitive.

The analysis includes the economic impact of offsets – a policy which forces suppliers to spend equivalent sums in Canada of any portions of the contract that is procured from foreign suppliers. The government's offset program encourages spending in research and development and technology transfer by allowing every dollar of investment to count for up to \$9 against the offset obligation. The economic benefits from these investments is shown in the report to be much less certain than the benefits from activity within Canada and comes with a cost premium. Experience shows that achieving returns towards the top end of the range of economic benefits presented this report will be a challenge, thus further favouring a local build.

These three factors, economic benefit, fiscal benefit, cost competitiveness make the choice evident. The federal government is investing in combat ships on behalf of Canadians, and Canadians would benefit on all fronts from having the ships built at home.

*Although it is intuitive that a domestic construction would produce greater economic benefits, this report examines in extensive detail the extent to which this is the case.*



**David Perry**

Senior Analyst and Fellow with the  
Canadian Global Affairs Institute

This report makes a vital contribution to the understanding of the costs and benefits of constructing ships in Canada under the National Shipbuilding Strategy (NSS), relative to building them overseas. Although it is intuitive that a domestic construction would produce greater economic benefits, this report examines in extensive detail the extent to which this is the case.

More importantly, the report shows that the costs of the build in Europe and Canada are broadly similar, and after accounting for a variety of factors, potentially even cheaper to build at home. This finding is based on a series of assumptions by PwC, which if the NSS proceeds as planned, are reasonable.

Further, the report investigates sensitivity of the results to different assumptions some of which could make the cost of build cheaper in Europe. However, in such a scenario the report demonstrates that after taking into account taxes and wider economic benefits it is still favourable to build at home.

It is important to keep in mind that the report's main finding assume the CSC project proceeds as planned within the wider NSS program of work, with CSC following straight on from AOPS. By doing so, Irving Shipbuilding Inc. will have familiarized itself with its new shipyard and processes, making its performance comparable to other shipyards producing modern frigates.

Finally, it is important to note that this report makes an 'apples to apples' comparison of the costs of building ships only and not wider program costs such as project management costs, initial spare parts, and contingencies. Many public discussions of the relative costs of building ships in Canada or elsewhere have compared the project budgets for NSS projects with publicly available information on foreign ships without specifying whether that foreign data pertains to the costs of building ships alone or includes all (or only some) of the items that in Canada comprise a project budget. Readers should keep this in mind when reading this report.

The views expressed here are his own.

# Executive summary

## Introduction

As part of its National Shipbuilding Strategy (NSS), Canada is looking to procure 15 modern frigates to bolster its defence capabilities and replace its existing general-purpose frigates. In doing so it aims to bring an end to the boom and bust cycles of vessel procurement that has slowed down Canadian shipbuilding and secure sustainable jobs for Canadians. Irving Shipbuilding Inc.'s shipyard in Halifax was awarded the prime contract to build the frigates under the NSS.

Our report compares the value for money to Canada from building 15 modern frigates in Canada versus purchasing them from overseas. The overseas comparator we use is based on a blend of Western European shipbuilders from France, Germany, Netherlands, Spain and the UK – referred to in this report as 'Build in Europe'.

No matter where the ships are built we assume that the national security benefits will be the same and these have therefore not been included in the analysis in this report. It is worth noting that building the ships in Canada will contribute to the development of sovereign shipbuilding capabilities in Canada. This report compares the economic and fiscal benefits to Canada in terms of job creation, impact on GDP and the public finances, as well as the cost differential of building the ships in the two locations.

Our report specifically excludes the costs of administering the NSS, initial on-board spares and full lifecycle costs as well as the longer term benefits as a result of the NSS.

## Findings

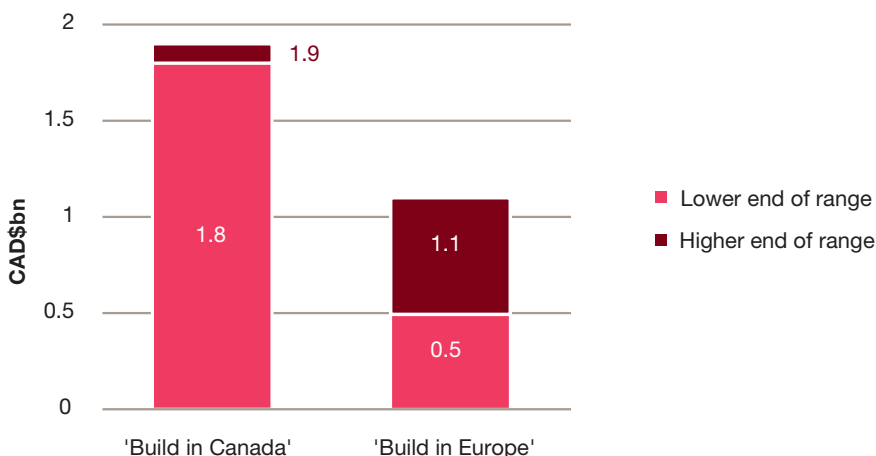
We have used a Benefit-Cost Ratio (BCR) as the best measure to assess the value for money to Canada of the two scenarios – 'Build in Canada' and 'Build in Europe'.

The wide range on the BCR for 'Build in Europe' is a result of the significant uncertainty in the scale and timing of benefits to Canada under the current Government offset policy<sup>1</sup>.

The economic and tax benefits in the 'Build in Canada' scenario are greater and more certain, driven by more 'On project' benefits such as the jobs and associated economic and tax benefits at the shipyard and in the supply chain. In contrast, the majority of the 'Build in Europe' benefits flow from spending in Canada to meet the offset obligations – referred to here as 'Off project' benefits. These benefits are less certain as they are dependent on success of the investments, particularly in areas such as research and development and technology transfer. In addition, there is little evidence to support the scale of such benefits, so we have applied a range to reflect this uncertainty.

For every \$1bn spent:  
**\$0.8bn**  
to  
**\$1.3bn**  
more benefit for the  
Canadian economy if  
the ships are built in  
Canada

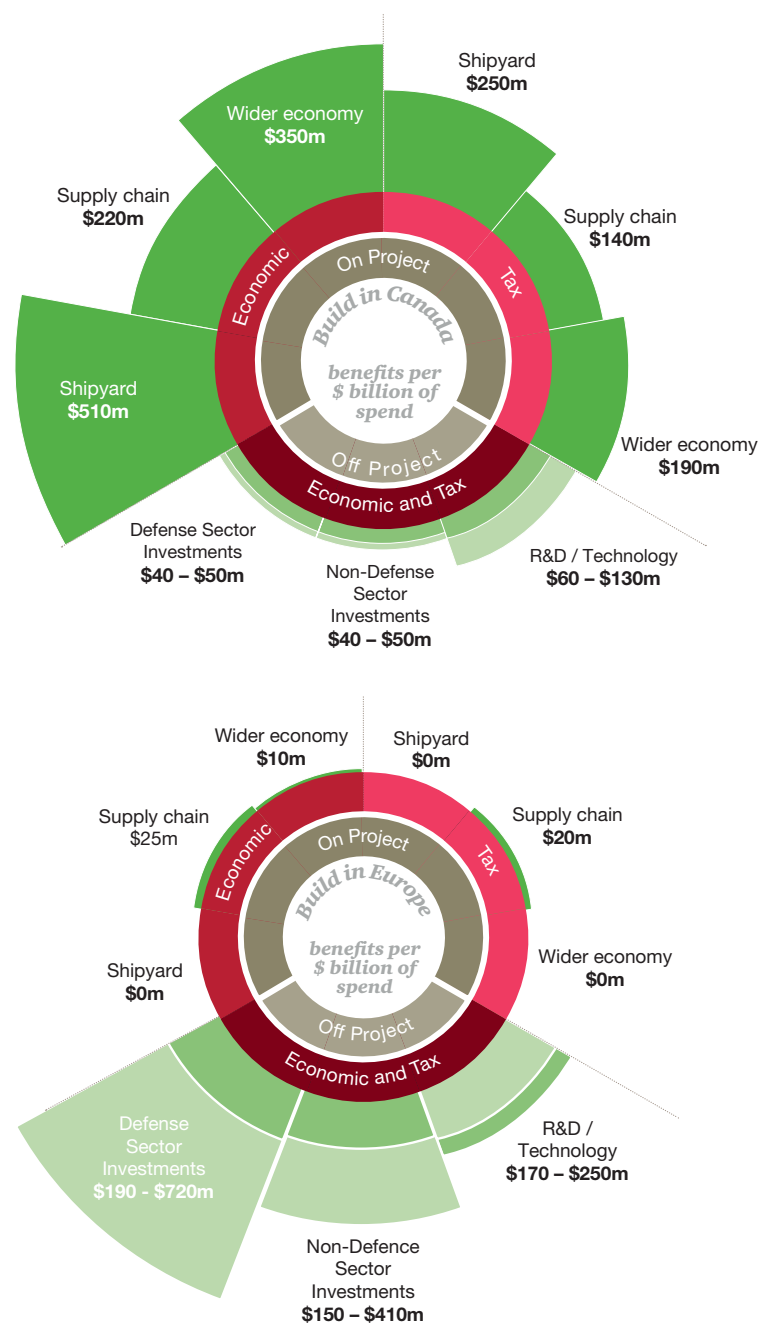
**Figure 1: Benefit Cost Ratio: Benefit to Canada from every \$1bn spent**



For every  
CAD\$1bn spent  
on building  
modern frigates  
in Canada  
about 8,000  
person years of  
employment are  
created

<sup>1</sup> Canadian defence contracts are subject to an 'offset' policy which aims to establish and develop a sustainable defence industrial base in Canada (or other economic activity in Canada) equivalent to the value of the defence contract

**Figure 2: Benefits for the Canadian economy<sup>2</sup> for every CAD \$1 billion spent in the ‘Build in Canada’ scenario**



	More Certain	Less Certain	
Key:	Positive Impact	Lower end estimate	Upper end estimate

<sup>2</sup> Excludes ‘Off project’ benefits in both scenarios associated with most of the major equipment spend as the benefits are likely to be the same in both scenarios

Comparing the costs and revenues to government

In addition to the benefits to Canada it is important to understand the impact on the public finances in terms of costs and revenues.

A ‘reference ship’ was used to enable a like for like cost comparison between the two scenarios. The reference ship is based on a modern frigate design, with capabilities and specifications which broadly match Canada’s requirements.

Areas such as ship design costs and relative inexperience in building modern frigates drive the initial cost in Canada higher than in Europe, but a combination of lower wage rates, the investment in the modern shipyard in Halifax with comparable performance to shipyards producing modern frigates effectively negate the cost difference. Taking into consideration the costs associated with meeting the offset obligation and the financing of the cost difference between the scenarios the ‘Build in Europe’ scenario becomes higher by some 13%.

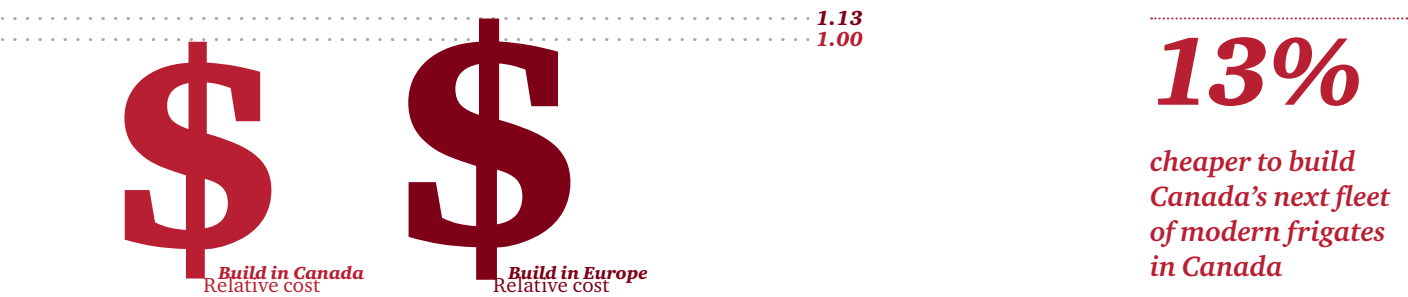


Table 1: Comparing the build costs (Base Case indexed costs)

	Scenario 1 (‘Build in Canada’)	Scenario 2 (‘Build in Europe’)
Cost of build	0.98	1.00
Cost to deliver offset obligation	0.02	0.07
Subtotal	1.00	1.07
Additional financing cost	–	0.06
Total cost to build frigates relative to base case	1.00	1.13
Taxes collected	(0.48) – (0.56)	(0.24) – (0.51)
Cost net of taxes	0.44 – 0.52	0.62 – 0.89

Source: PwC analysis

A further benefit of a ‘Build in Canada’ strategy is the additional tax revenues that will be collected by the Federal and Provincial governments over the lifetime of the build. From the Canadian Government’s perspective, this could be viewed as a discount on the cost of the build, further reducing the cost of the ‘Build in Canada’ scenario.

Taking this approach, we estimate the overall ‘Build in Canada’ scenario to be around 29% (at high end of estimates) – 42% (at low end of estimates) cheaper than the ‘Build in Europe’ scenario. Another important consideration is foreign exchange risk: nearly half of the build costs under the ‘Build in Europe’ scenario (45%), in areas such as wages and overheads, would be incurred in foreign currencies rather than Canadian Dollars. This adds significant risk for a contractor in the ‘Build in Europe’ scenario which it would look to pass on to the Government of Canada.



## What if 'Build in Europe' cost less?

Our results reflect our Base Case cost estimates. However, they are sensitive to a number of key assumptions such as the productivity of the shipyard and wage rates.

Detailed sensitivity analysis can be found later in the report, but to demonstrate the potential effect of different assumptions we look at the effect of applying Spanish wage rates and productivity (the lowest in Europe and the biggest low end sensitivity in the cost modelling).

Using the estimated Spanish wage rates, but keeping all other assumptions constant, the estimated costs would be less than the 'Build in Canada' Base Case by some 13-14%. However, the benefits would in turn be lower by some 50-80%. This loss of benefits to Canada is estimated to exceed the cost to the Government of financing the additional costs of the 'Build in Canada' scenario.

Therefore, it is more favourable for Canada to 'Build in Canada' as it delivers greater value for money, as reflected in the revised BCRs, which for 'Build in Europe' is 0.6-1.3 and for, Build in Canada, is 1.8-1.9.

## Other scenarios considered

In deciding our comparator scenario we considered the 'Build in Europe' scenario along with two other scenarios: 'Joint Canada-South Korea Build' and 'Build in USA'.

The 'Joint Canada-South Korea Build' was ruled out on the basis that any cost savings from using a South Korean shipyard would be offset by increased costs associated with the added complexity of a two location approach. In addition, to qualify as a supplier for the CSC program bidders must be from NATO countries or Australia or New Zealand. The 'Build in USA' scenario was rejected because of the limited cost differential between Canada and the USA. This is driven by higher estimated average wage rates in the USA compared to Europe and similar upgrade costs to Halifax to build the 15 ship program for Canada.

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## 29% – 42%

*Cheaper to 'Build in Canada' after taking into account tax revenues*

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