

# Should the government invest in energy efficiency of buildings? Macroeconomic impact assessment

## Executive Summary

May 2012

Authors: Ing. Miroslav Zámečník a Ing. Tomáš Lhoták, PhD.

The analysis was ordered by Chance for Buildings ([www.sanceprobudovy.cz](http://www.sanceprobudovy.cz)) and sponsored by:

Main Sponsors:



Other Sponsors:



Also supported by:



## Introduction

The Government of the Czech Republic has declared fiscal stabilization as its top priority. Public sector deficit is to be reduced to 3% by 2013 and balanced budget is to be achieved by 2016. To achieve this objective a range of tax increases and expenditure cuts have been implemented, resulting in public sector deficit of 3.1% in 2011. Further fiscal restriction is scheduled for 2012 and the following years.

However, it is becoming apparent that the fiscal consolidation strategy is leading to significant deceleration of economic activity with negative growth of GDP of 1% (y/o/y) recorded in the Q1/2012, the trend continuing in Q2 and projected to even worsen in Q3 and Q4. Disappointing growth performance calls for implementation of specific policy interventions aimed at stimulation of economic activity. We have reviewed some of the options available to the policymakers to induce economic growth by **targeted support for investments in enhanced energy efficiency in buildings**, both housing and public sector (hereafter "IIEEB").

The Analysis has estimated the impact of energy efficiency improvements in housing and public sector buildings on the following parameters:

- a) GDP
- b) employment
- c) tax revenues
- d) social security revenues
- e) energy savings
- f) reduction of greenhouse gases (CO<sub>2</sub>)

We have utilized Input-Output tables compiled by the Czech Statistical Office and expert estimates of average investments, energy savings and reduction of greenhouse gases per project. We have compared the results of the Analysis with generic fiscal multipliers calculated by the Czech National Bank, IMF and OECD.

## Methodology

We have worked under the following assumptions and considerations:

1. The impact on employment has been calculated based on gross value added and productivity of labor for relevant industries as reported by the Czech Statistical Office.
2. Social security revenues are calculated based on employment impact, considering however the ratios of employees versus self-employed (construction sector relies on self-employed labor to much higher extent than most other industries).
3. Investments in construction sector yield positive macroeconomic impacts even under assumption of stable savings ratios and non-negligible substitution effects thanks to extraordinarily high multiplier effects in case of construction industry vis-à-vis most of alternative expenditures in the Czech Economy.

## Summary of results

1. **IIEEB by themselves have extraordinarily high values of transaction multipliers**, which then translate into better macroeconomic impacts. IIEEB are typically construction projects relying on input of domestic labor and materials with very small import leakage. In comparison, average public investment projects involve a significantly higher share of imported capital goods or imported components or materials. While for generic public sector investment reported values of the GDP multipliers range between 0.43-0.7 (to be on the safe side, we worked with the more conservative Czech National Bank's estimate of 0.6 as a midpoint), for IIEEB we have obtained significantly higher values of GDP multiplier ranging between 0.81-0.90. This means that every CZK 1m spent on IIEEB increases GDP by up to CZK 0.90m in contrast to generic government spending which would yield GDP growth of CZK 0.6m on average.
2. **Some of the measures in IIEEB can be further improved by introducing financial leverage.** If government sets the program correctly, it can mobilize significant additional amount of private capital (again, to be on the safe side we have considered the leverage of 1:1.5 to 1:3, while it could be argued better leverage is possible), which further significantly improves the macroeconomic impact. To ensure good leverage the program needs to be reviewed and adjusted periodically.
3. IIEEB intervention in private housing area consequently yields significantly better values for GDP growth than average generic public sector investments. **Every additional investment of CZK 1m into IIEEB induces on average CZK 2.13m additional growth of GDP.** In specific scenarios, the additional growth of GDP reached even higher – up to CZK 3.59m.
4. IIEEB have better macroeconomic impact also on employment rate and tax revenues. **Every additional CZK 1m induces direct fiscal effect of CZK 0.967m in year one**, related to increased employment and overall tax income. Again, in specific scenarios, the tax revenues can reach up to CZK 1.21m.

SUMMARY OF RESULTS BY INDIVIDUAL MEASURES (WITH FINANCIAL LEVERAGE)							
	MEASURE			Leverage	Induced GDP m CZK	State budget revenues m CZK	Social security revenues m CZK
	Building type	Activity	Extent				
1	Multi-family	Renovation	Partial	1:3	3,59	1,21	0,20
2	Single-family	Renovation	Partial	1:3	3,56	1,20	0,20
3	Single-family	Renovation	Deep	1:3	3,43	1,16	0,20
4	Multi-family	Renovation	Deep I.	1:3	3,36	1,14	0,20
5	Multi-family	Renovation	Deep II.	1:3	3,34	1,13	0,19
6	Multi-family	New build	Passive h	1:1.5	2,24	0,76	0,12
7	Multi-family	New build	NZEB	1:1.5	2,17	0,73	0,12
8	Single-family	New build	NZEB	1:1.5	2,14	0,72	0,12
9	Single-family	New build	Passive h	1:1.5	2,06	0,70	0,12
10	Public	New build	NZEB	-	0,87	0,29	0,05
11	Public	New build	Passive h	-	0,85	0,29	0,05
12	Public	Renovation	Partial	-	0,84	0,28	0,05
13	Public	Renovation	Deep I.	-	0,84	0,28	0,05
14	Public	Renovation	Deep II.	-	0,82	0,28	0,05

## Final Remarks

In a small open economy such as the Czech Republic, improving energy efficiency of buildings, especially residential but also public, **ranks among the best pro-growth policy options** available to policy makers. This holds true especially in the case of the Czech Republic which is currently experiencing a mild recession and significant slack in the economy, yet undergoes a severe fiscal consolidation program at the same time.

The extraordinarily high transaction multiplier of construction coupled with high domestic content of inputs used and significant labor intensity all contribute to macroeconomic attractiveness of this type of intervention. We are **not aware of any alternative with comparable potential** in short to medium term.

If the government wants to be serious about pro-growth measures, it has to consider the merits of this policy option. A well-calibrated program will induce significant additional demand and its **macroeconomic impact will be much higher than channeling these revenues into the state budget**. Therefore, all available extra-budgetary revenues (e.g. EU ETS revenues) should be deployed into such program. Other funding opportunities such as direct state budget funding or EU cohesion funds should also be considered.

The government should pay special attention to private residential segment, as the financial leverage could be usefully deployed to mobilize significant amount of private capital without contributing to market imbalances and public sector debt levels.