

# Can utility-operated energy efficiency programs contribute to GDP and employment growth?

## A case study of Geneva

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# Context

- Energy efficiency programs for utilities
  - Energy savings
  - Integrated resource planning
- Non-energy benefits and costs
  - Economic (GDP)
  - Social (employment)
  - Environmental (air pollution, health)



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Image sources: <http://www.capitalradio.es/previsiones-lee-el-pib-crecera-un-14-en-2014-y-al-menos-un-25-en-2015/>  
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<http://www.apprentis.ch/cms/consels>



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# Question

Can utility-operated energy efficiency programs contribute to GDP and employment growth?

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# Case study

- Swiss energy efficiency programs
  - Major actors: state, cantons and municipalities
  - Role of utilities not yet clearly defined
- *éco21* energy efficiency program portfolio
  - Canton of Geneva
  - Administered by local utility Services Industriels de Genève (SIG)
  - Fully operational since 2009
  - Residential and non-residential energy saving and CO<sub>2</sub> reduction programs

# Case study

- Residential energy saving programs
  - *Eco-sociales*
  - *Communs d'immeubles*
- First year energy savings 2009-2014
  - 23 GWh = 27% of *éco21*
- Energy efficiency measures
  - Lighting
  - Household appliances
  - Other equipment (e.g., circulation pumps)

# Methodology

- GDP and employment
  
- Input-output model
  - Final demand
  - Upstream impacts
  - Downstream impacts
  
- Gross impacts
- Net impacts

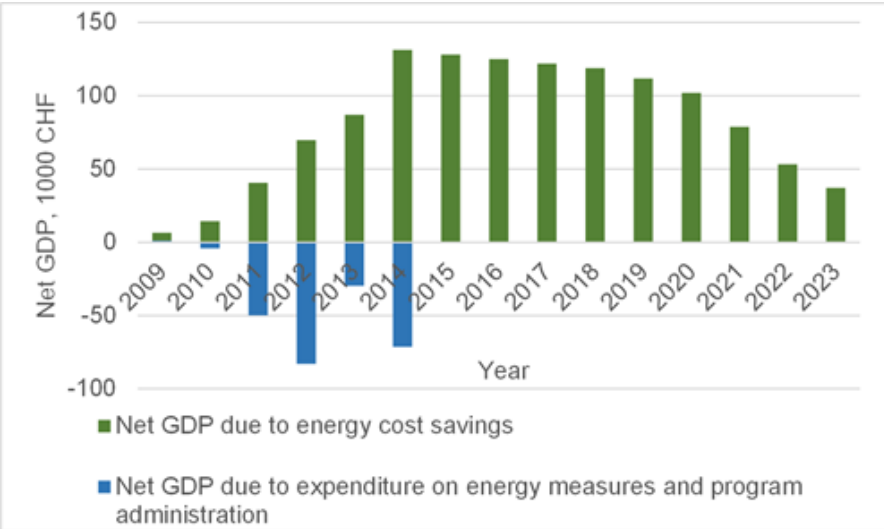
Industry to industry input/output table										
To From	Intermediate demand				Total	Final Demand	Exports	Total Supply		
	Mining	Manufacturing	Construction	Services					Public and private	
Intermediate Inputs	Mining									
	Manufacturing	Intermediate usage					Final demand			
	Construction	Q1				Q2				
	Services									
Primary Inputs	Wages & Salaries									
	Gross operating surplus	Primary inputs to production					Primary inputs to final demand			
	Taxes	Q3				Q4				
	Imports									
<i>Australian Production</i>										

Input-Output table illustration

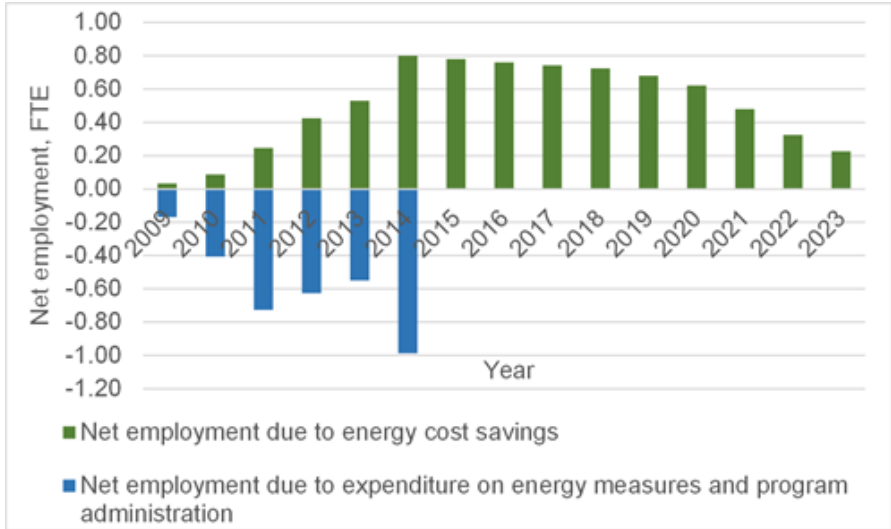
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# Main results

- Positive net impacts on GDP and employment:
  - 0.2 CHF *additional* GDP per 1 CHF of initial expenditure
  - 0.7-1.6 *additional* jobs in FTE per 1 million CHF of initial expenditure in *Eco-sociales* and *Communs d'immeubles* respectively

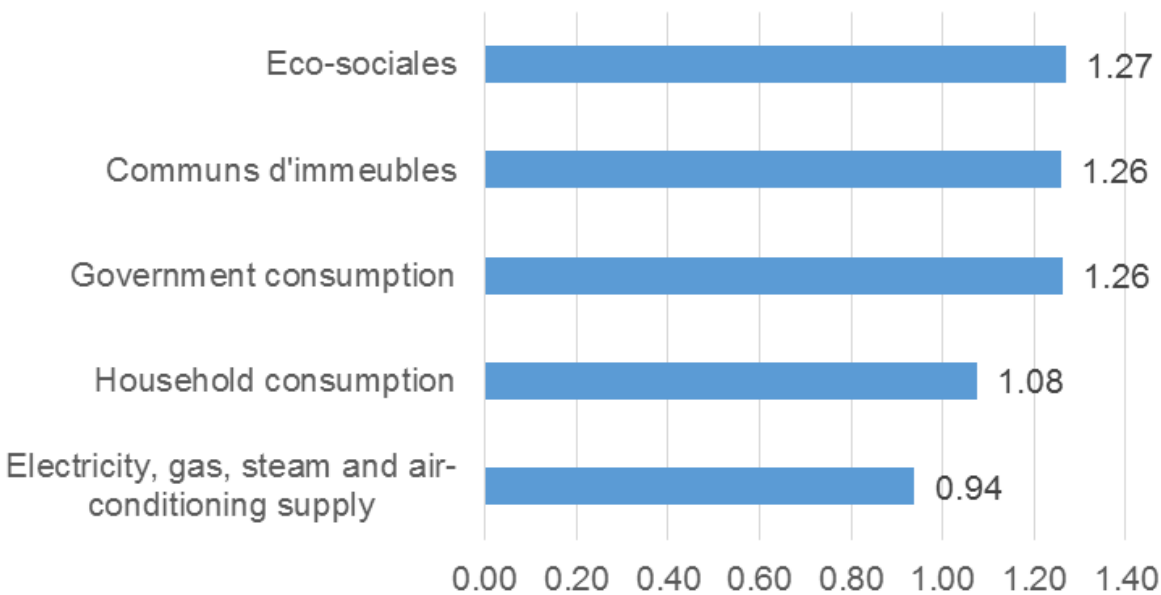


Total net impacts on GDP of *Eco-sociales* in 2009-2023

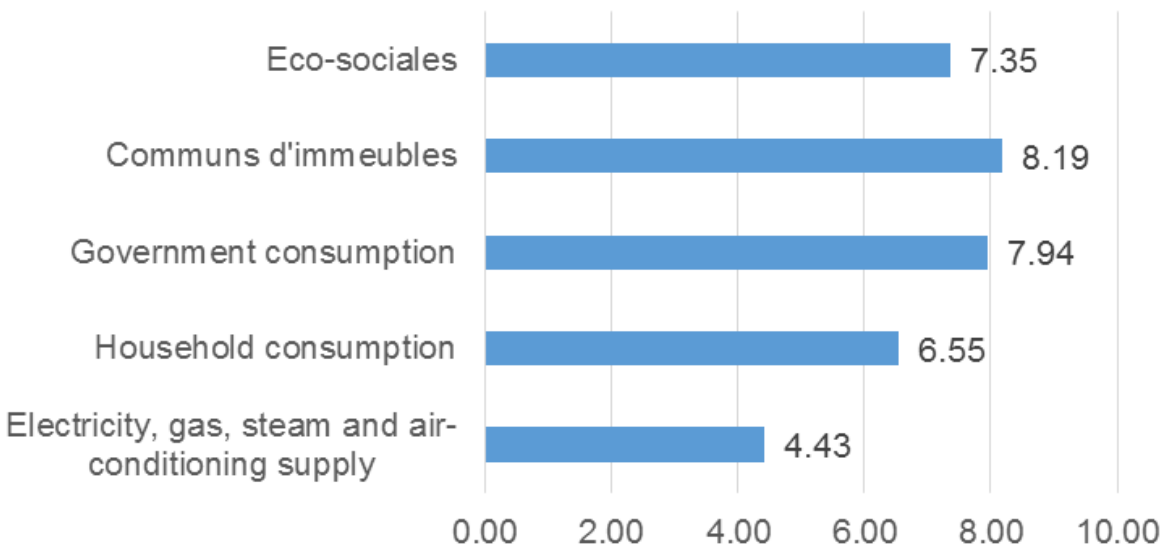


Total net impacts on employment of *Eco-sociales* in 2009-2023

GDP per unit of initial expenditure (CHF/CHF)



Employment per unit of initial expenditure (FTE / million CHF)



## Main results

- Comparable or higher gross impacts vs. other types of expenditure





# Conclusions

- Energy efficiency programs can contribute to GDP and employment growth
- Positive macroeconomic impacts are not granted
- Need to integrate energy efficiency with other policies in practice
- Utilities should have an active role

# Supplementary materials

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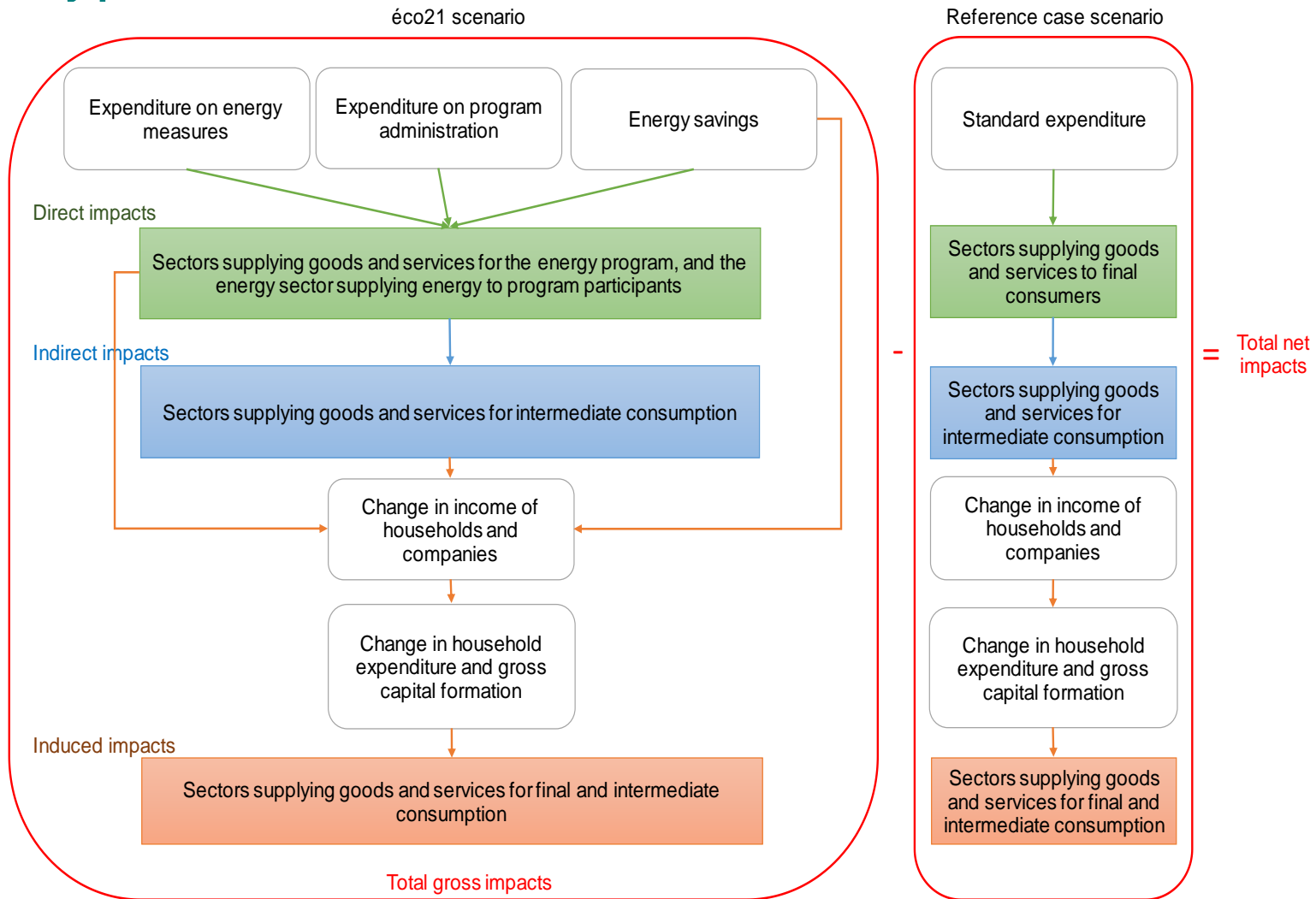
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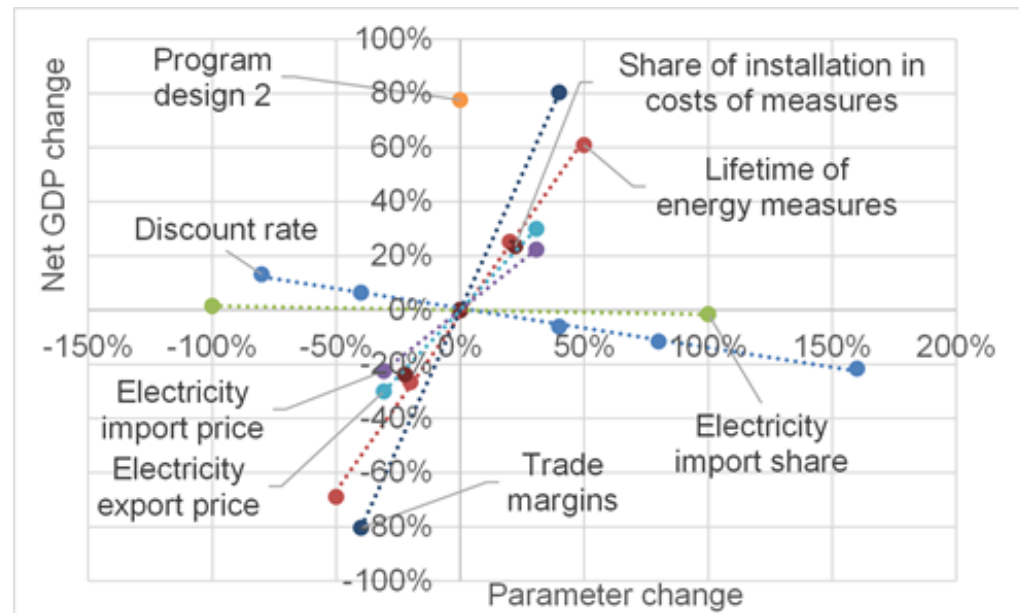
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# Impact types



# Main results

- Results highly depend on multiple parameters, incl.:
  - Cost-effectiveness of energy efficiency programs
  - Origin of equipment
  - Energy prices
  - Impact of energy savings on energy sector



Sensitivity analysis of total net impacts on GDP of *Communs d'immeubles* deployment