

# How To Save Energy Using Renovation Policy Measures

*The overall performance of current best practice  
renovation policies for residential buildings in  
Sweden*

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# Overview

- Historical and political context relating to renovation.
- Key factors that were significant in driving change.
- How Sweden reduced their consumption: what mixtures of measures worked.
- Market conditions at the time of development of the renovation strategy.
- Sweden's renovation story.

# Historical & Political Context

- Environmental policies since the 1960s.
- Cold climate – forced to build well insulated buildings
- Hydro- and nuclear power production and district heating means low GHG emissions from buildings
- Overall national zero-net GHG emissions target for 2050.
- Sweden's 'Integrated Climate and Energy Policy' (ICEP) introduced the goal of increasing energy efficiency in buildings by 20% in 2020 and by 50% in 2050.

# Mixture of Measures: Holistic Package

- Overall country reduction targets,
  - Government set a zero-net GHG emissions target (2050)
  - Integrated Climate and Energy Policy increase EE by 50% (2050)
- Energy requirements for both new buildings and renovations
  - Both have the same requirements – has been noted and new requirements are to be presented in June (implemented Jan 2015)
- Labelling schemes (EPC)
  - Auditing of buildings energy performance
  - Strict performance requirements and implementation of EPCs
  - Large percentage of buildings have labels
- Audits are required to provide information on energy saving measures
- Training and education campaigns
- One-stop solution centres
  - Centre for Renovation / Bebo (Multi-family house) / Belok (Commercial) / Besmå (single family)

# Exemplary Deep Renovation Projects



## BROGÅRDEN, ALINGSÅS

- The first, really big Million area renovated to almost passive house standard.
- A total of 16 buildings that will be completely renovated.
- The first three buildings are completed.



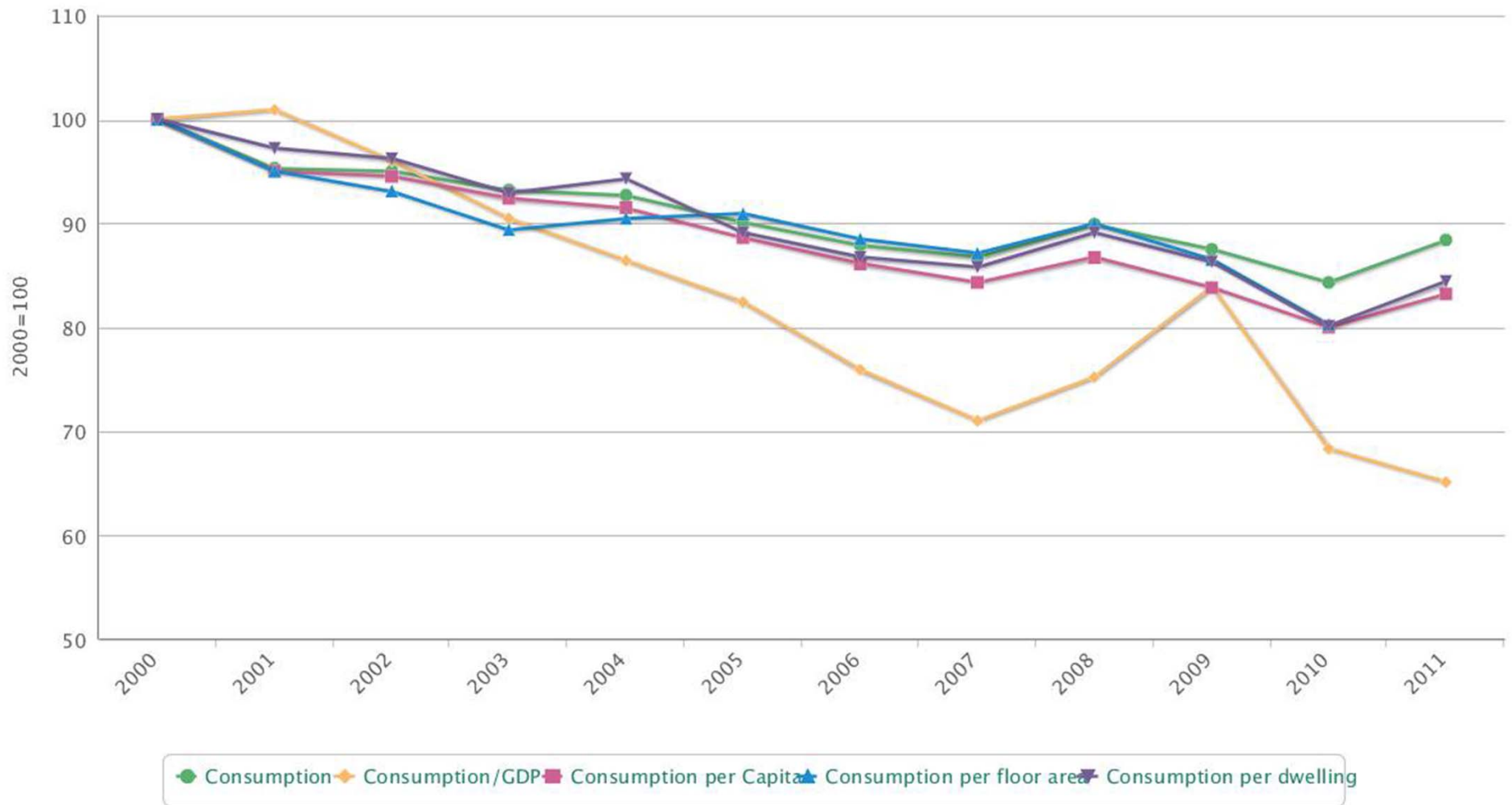
## renZERO

- 1.5 million houses built before 1980- large proportion in need of renovation and energy efficiency.
- Three companies developing renZERO™ concept, a cost effective renovation concepts for single-family houses built before 1980 to become nearly zero energy.
- Developed for Nordic weather conditions.

<http://www.renzero.se/>

# Change in Energy Consumption (Base year equals 100)

Sweden



# Challenges for Sweden

- Most buildings built in the 60s-70s (Million Program) with poor energy performance
- 75% of existing buildings need to be renovated by 2050 – over 100,000 a year
- Today: between 20,000-30,000 renovated each year
- Incentives are needed
  - To renovate and increase efficiency in Million Program
  - To increase rate of renovation
- A new “Million Program” for renovation



# Key Factors that must be considered

- Improvement of housing performance
- Better quality of life
- Correspondence to needs of elderly people
- Housing adjustment for disabled people
- Energy conservation & improving energy efficiency
- Reduction of GHG emission
- Generator of employment
- Economic revitalization
- Improvement of hygienic matter
- Health of nationals
- Disaster prevention, safety

***Most factors target the society in Sweden***



# Market Conditions

## Market Parties Efforts:

- The *Building industry has settled*, in Sweden subsidies for new building and renovation have been cut significantly
- Tax reduction for renovations (ROT) has stimulated energy efficiency & renovation
- Collaboration of market parties to deliver renovations – “Low-Energy Buildings Programme (2010) – Lågan ([www.laganbygg](http://www.laganbygg))

# Sweden's renovation story

- Plans – overall targets
- Ambition of the business sector: want to go further – use 2050 target to gather momentum
  - Building community can do better than current regulation
  - Especially with regards to energy issues and performance
- Awareness of energy efficiency of residents – taught from a young age
- Best practice building data quality
  - all available online
  - Know where Sweden stands
- Whole society has high standards for building performance
- High degree of penetration of:
  - District heating
  - Heat pumps
  - Triple glazing
- Low rate of new construction – relative importance of renovation increases
- Existing network in Bebo/Belok

# Closing Remarks

- Cooperation between politics, government, and construction sector
- Financial solutions are needed
- We must go beyond best practice and towards “state-of-the-art” practices aiming for a shift to **deep renovations** of the building stock.
- More information to the whole public.