

# BUILDING RENOVATION IN LITHUANIA – A MEASURE FOR ENERGY EFFICIENCY, THE REDUCTION OF GHG EMISSIONS AND AIR POLLUTION



Mindaugas Gudas  
Lithuanian Environmental Protection Agency

# RESIDENTIAL ENERGY EFFICIENCY



## Lithuania key statistics:

- Population – approx. 3 mln.
- 66% of population lives in multi-apartment buildings built before 1993  
(> 800,000 apartments in > 38,000 multi-apartment buildings and)  
**97% privately owned,**
- 65% of buildings supplied by district heating system

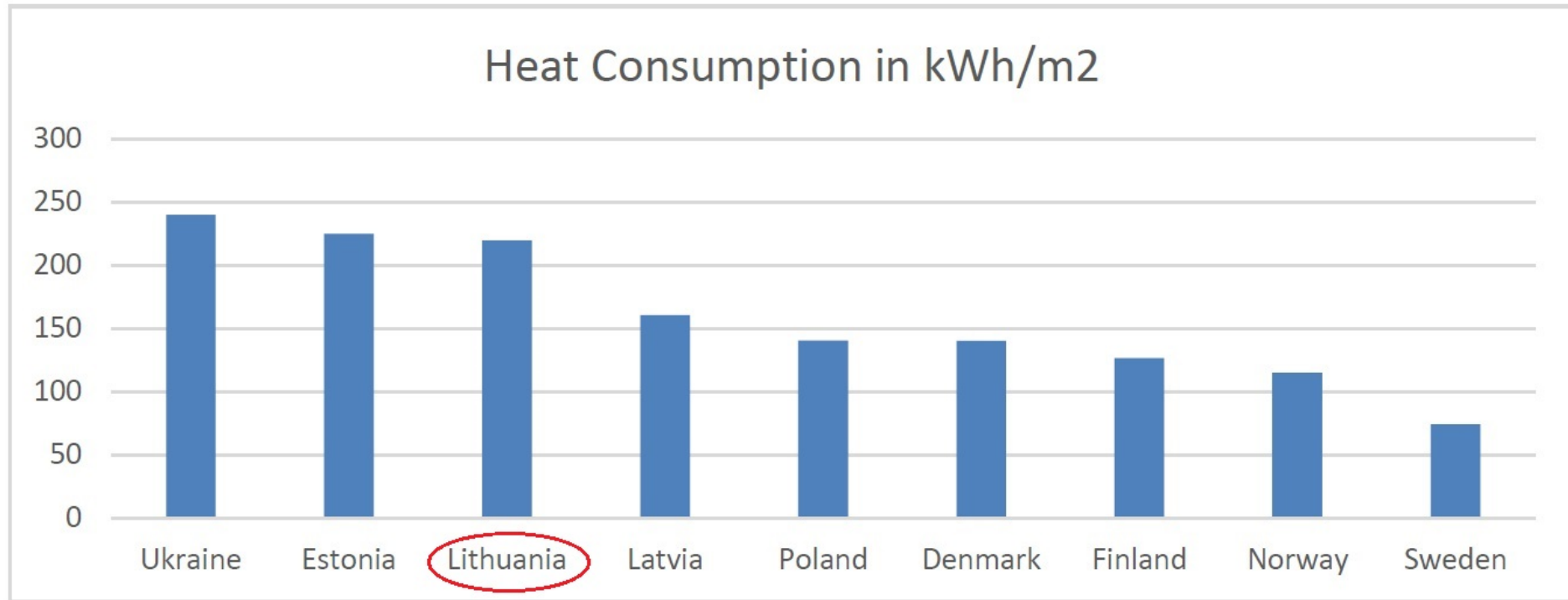


## Problems:

- Old construction standards and effects of little maintenance
  - inefficient heating systems and engineering equipment
  - poor quality windows, roofs, seals between panels
  - big energy losses
- Many buildings in rather poor condition, many of them lack proper management



# Lithuanian heat consumption in buildings in the international context



Source: Euroheat & Power, <http://www.euroheat.org>.

Housing consumes 33 % of final energy, but it has the largest energy saving potential – **approx. by 48 %**

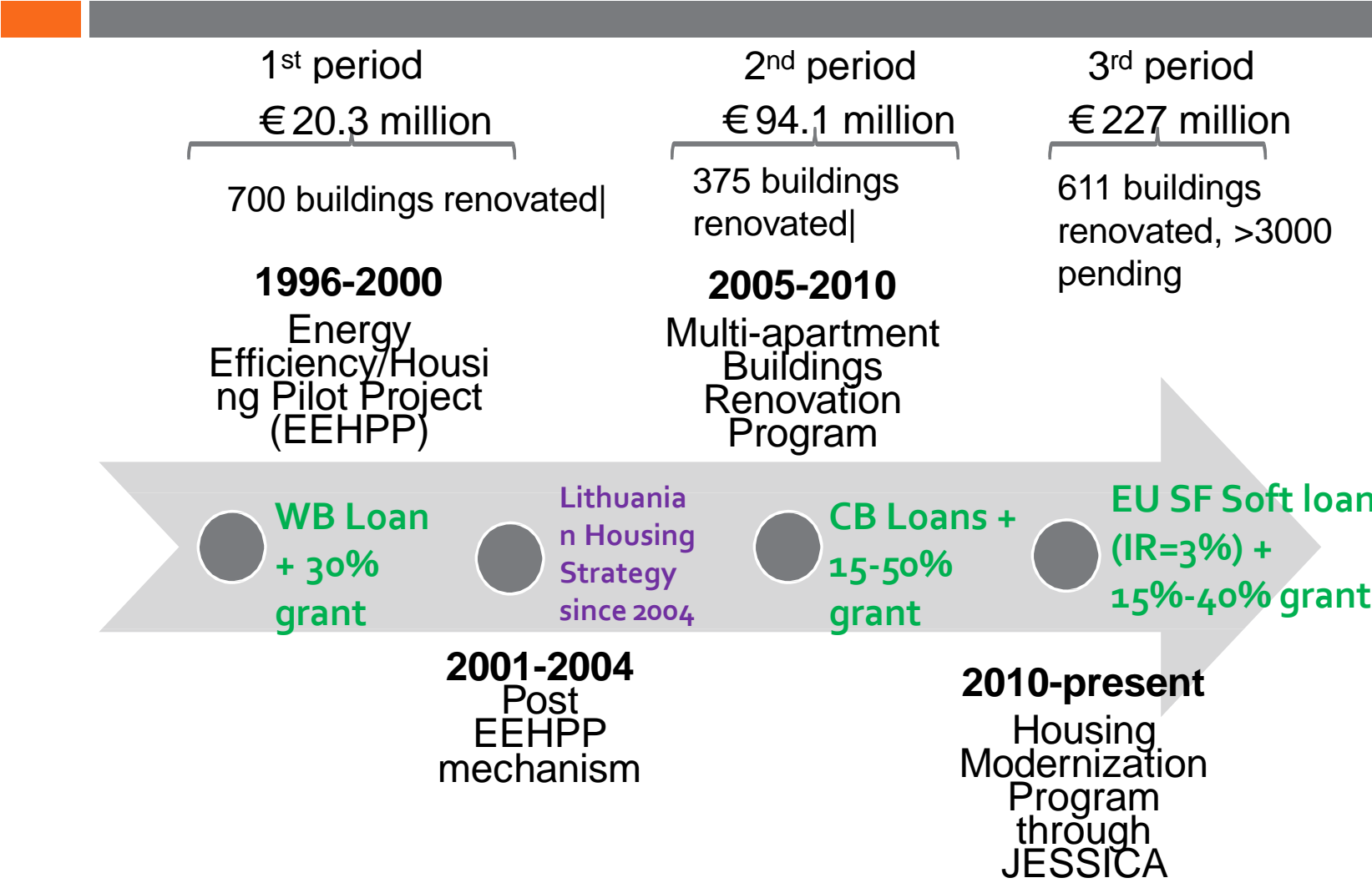
# Framework for Action

- The importance of increased energy efficiency recognized early- first attempts since 1996
- However, the real momentum took place since 2013

## **Main driving documents:**

- The National Energy (Energy Independence) Strategy 2020–2050 – by energy efficiency and other measures aims by 2020 at 5 % reduction of GHG emissions and reduction of annual expenditures on imported energy corresponding to 3-4 % of national GDP
- Lithuanian Housing Strategy – advocates for housing modernization, including rational use of energy resources

# Major Housing Modernization Programs in Lithuania



# MULTI-APARTMENT BUILDINGS RENOVATION (MODERNISATION) PROGRAMME

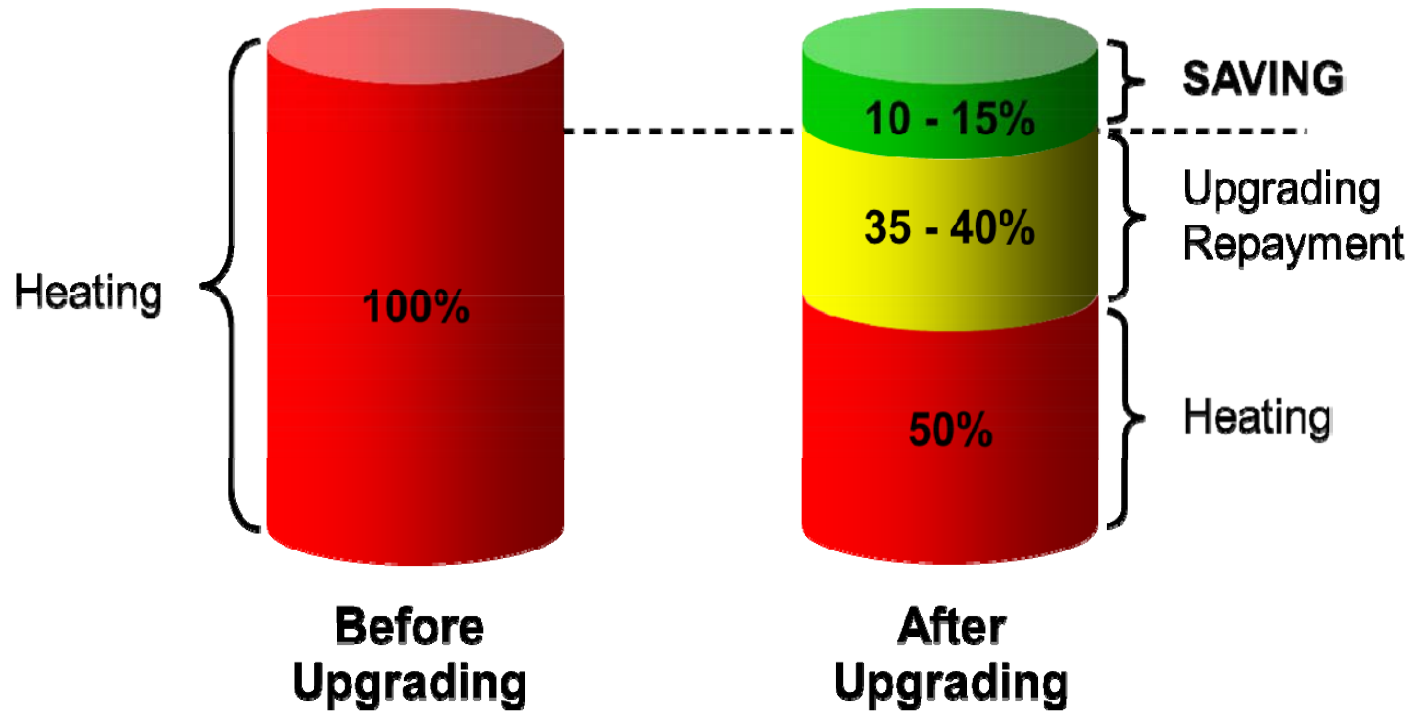
The Government of the Republic of Lithuania approved multi-apartment buildings renovation (modernisation) Programme in 2004

The Programme aimed to:

- by 2020 increase energy efficiency in no less than 4000 multi-apartment buildings
- ensure that cumulative annual heating costs and return on investment cost after the renovation do not exceed the heating costs which was before renovation



# DISTRIBUTION OF COSTS TO CONSUMERS BEFORE AND AFTER RENOVATION



# PROGRAMME MODELS

There are two models for housing modernisation in Lithuania

1. Home owners prepare investment projects, take loans and implement modernisation
2. Investment projects implemented on the basis of Energy efficiency programmes approved by municipalities (starting from 2013):
  - ❑ Investment projects are prepared on the municipality initiative
  - ❑ projects are implemented by the Programme administrator appointed by the Municipality
  - ❑ loan is taken by the Programme administrator
  - ❑ programme administrator organizing procurement, taking all the responsibilities for the implementation and financial management



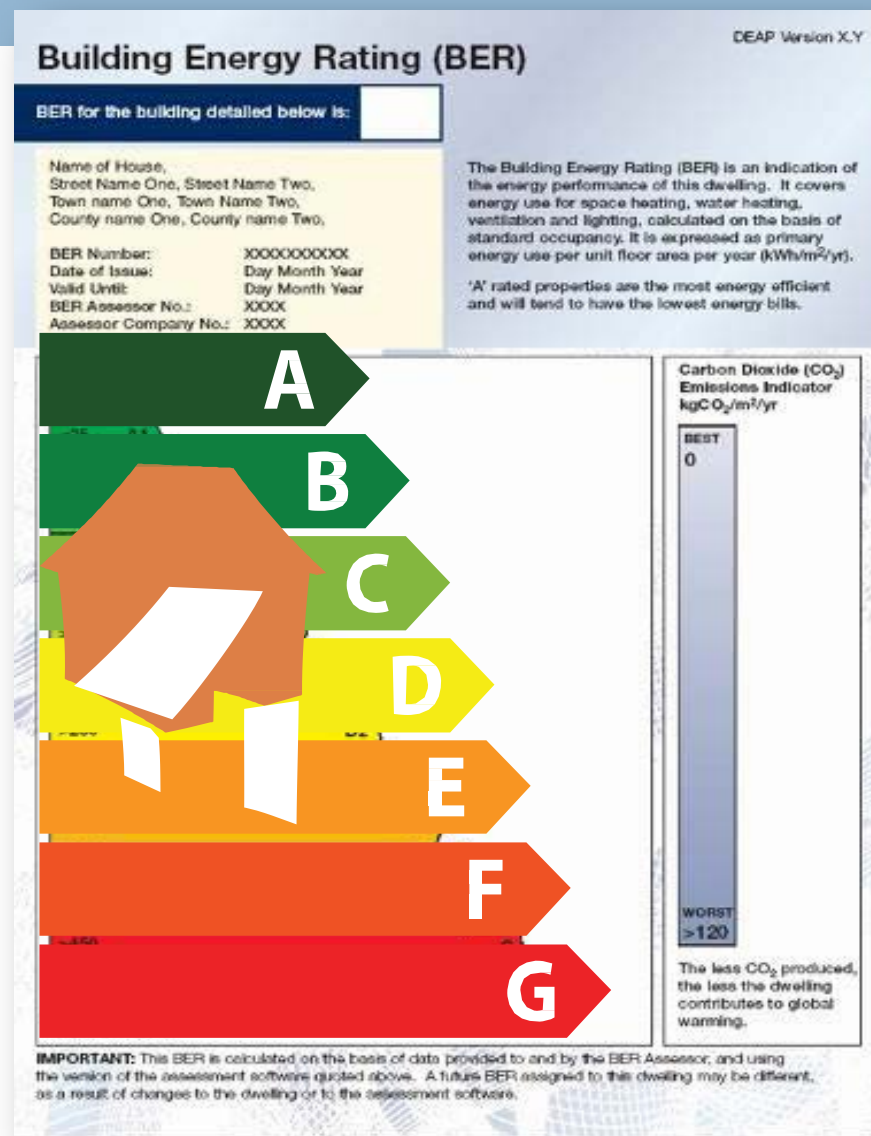


# FUNDING CONDITIONS FOR RENOVATION OF MULTI-APARTMENT BUILDINGS

Energy performance certificates

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- ♦ Majority of home-owners vote for modernisation **50%+1**
- ♦ Constructed before **1993**
- ♦ at least Energy Efficiency **Class C**
- ♦ **100%** of costs for technical documentation and supervision
- ♦ 15% of modernisation costs if at least **20% of energy savings** achieved
- ♦ additional **<25%** if energy savings **40%** achieved (Climate Change Programme support)
- ♦ **100%** of all costs for low income households



# FUNDING CONDITIONS FOR RENOVATION OF MULTI-APARTMENT BUILDINGS

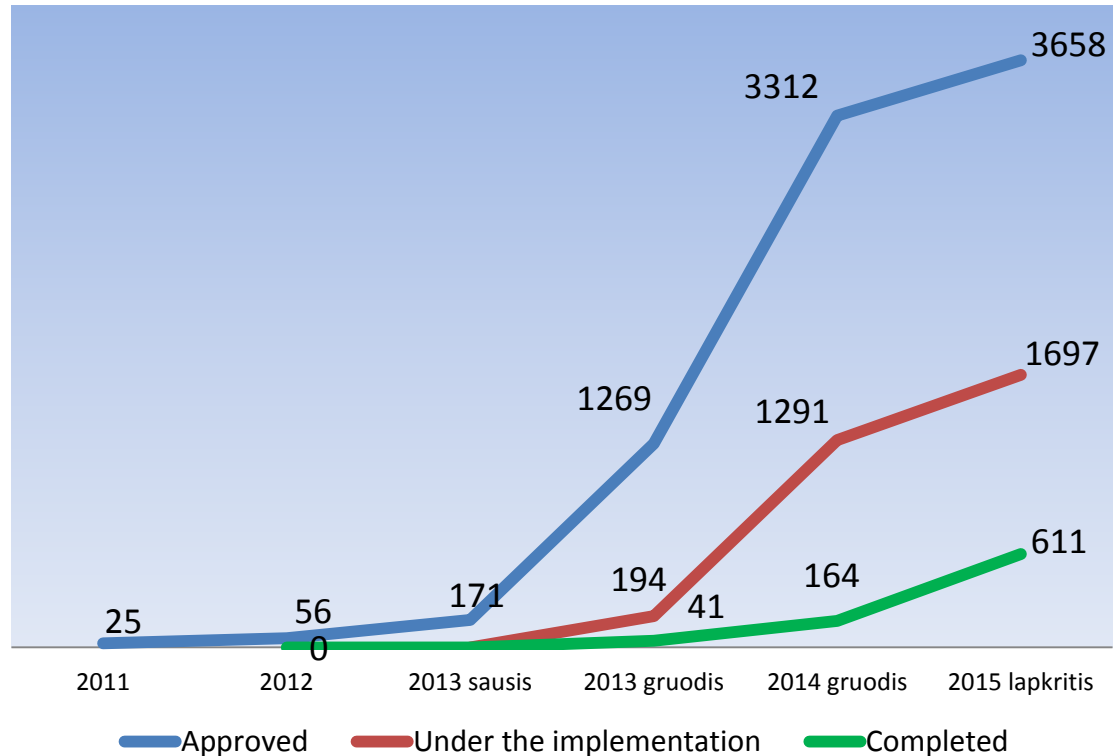
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- ◆ **Maturity** – **20** years
- ◆ **Loan interest rate** – fixed for the entire loan period at **3% p.a.** Loan **tied to the apartment** (not the owner)
- ◆ **Self-financing** – bank may require a down payment (not more than **5%**)
- ◆ **Insurance** – no loan insurance requirements
- ◆ **Guarantees** – no third party guarantee requirement

# MULTI-APARTMENT BUILDINGS RENOVATION (MODERNISATION) PROGRAMME

## WHAT HAS BEEN ACHIEVED?

- ❑ new model of the program was introduced at the beginning of 2013
- ❑ under the new model, all municipalities approved energy efficiency programs



- ❑ since 2013 approved more than 3.600 multi-apartment buildings
- ❑ currently approx. 1.700 multi-apartment buildings are being upgraded
- ❑ since 2013 completed 611 project

# ENERGY EFFICIENCY POSSIBILITIES (1)

Experience from energy efficiency upgrading projects in Lithuania shows that a combination of measures:

- ❑ replacement of windows and external doors
- ❑ insulation of external surfaces: roofs and walls
- ❑ modernization of heating substations and balancing of heat systems

**reduce energy consumption by around 50%**



# ENERGY EFFICIENCY POSSIBILITIES (2)

## Savings after renovation:

- ❑ comparative thermal energy savings – 211,29 kWh/sq.m./year
- ❑ yearly heating energy savings in the building – 233,84 MWh/year
- ❑ CO2 emissions reduction – 54,38 tonne/year



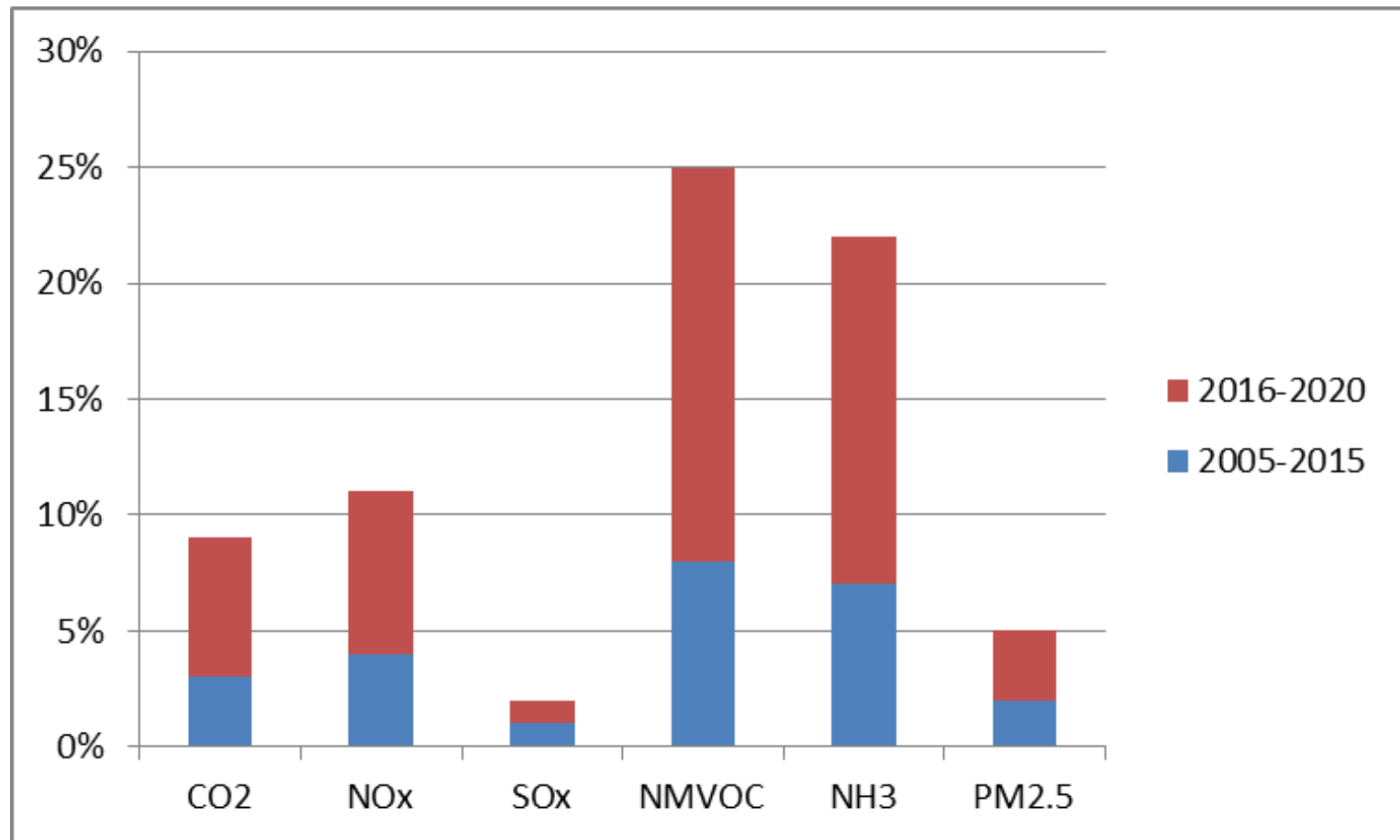
## BENEFITS

**Good for homeowners:** greater comfort, lower bills, added value

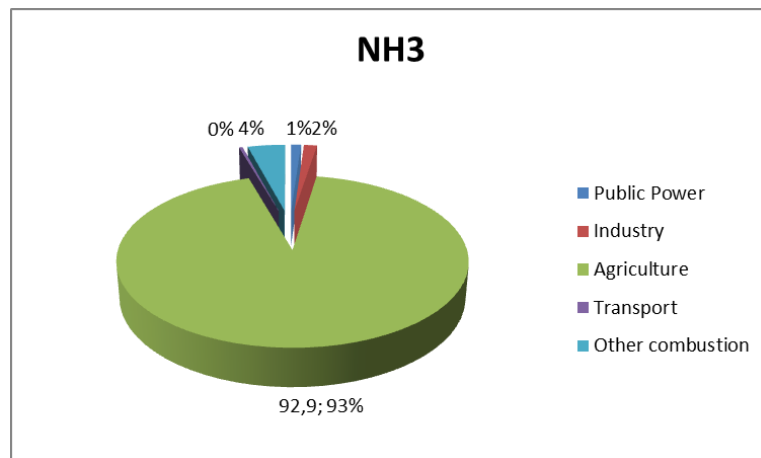
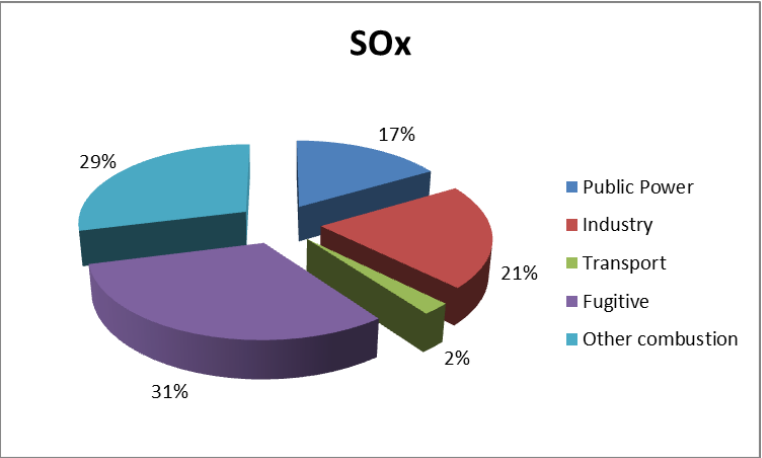
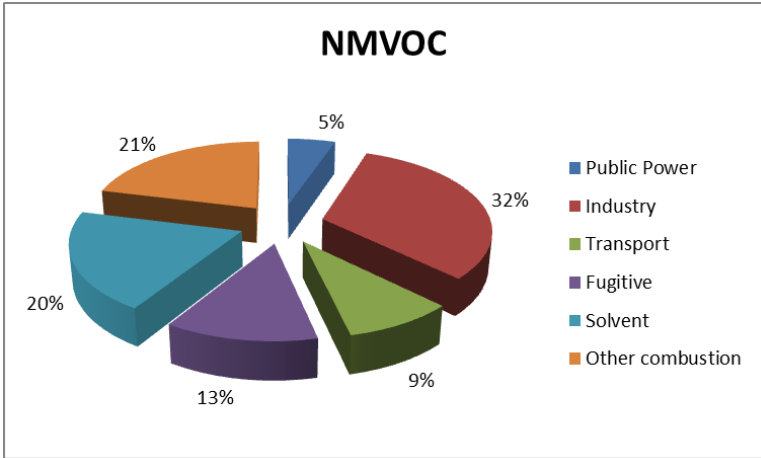
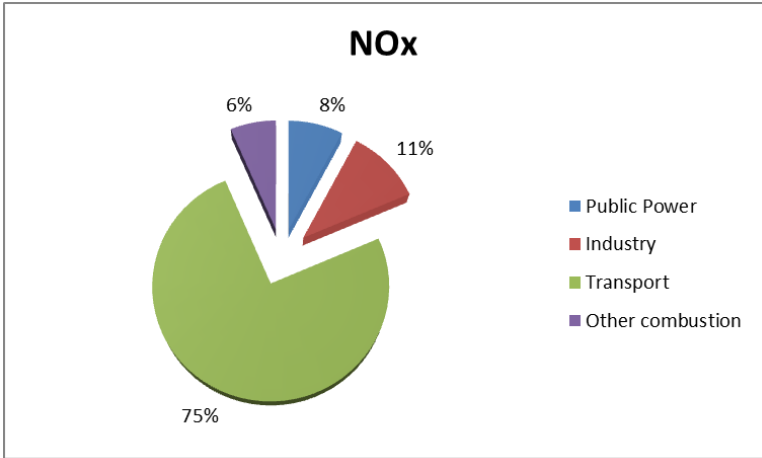
**Good for Lithuania:** reduced gas purchases, better security of supply

**Good for the Planet:** lower carbon emissions, resource conservation

# GHG and air pollution reduction potential in a Public Electricity and Heat sector due to Multi-apartment renovation program



# Public electricity and heat sector contribution to air pollution in Lithuania



Public electricity and heat sector contribution to national GHG emissions – 12 %

# FURTHER APPROACHES AND THEIR IMPLEMENTATION

For more significant energy efficiency in the City level, the following working areas are pursued:

1. expand energy efficiency programmes of City municipalities by including renovation of public buildings
2. encourage City municipalities to prepare energy efficiency programmes for the renovation of groups of buildings/quarters, also including heat production and distribution, street lightning and other engineering infrastructure





# NEW MODERNISATION PROGRAMME MODEL FOR PUBLIC BUILDINGS

- ❑ Since this modernization program had a success in its implementation for multi-apartment buildings (in 2013-2015), Lithuanian Government decided to apply this model also for the modernization of municipal public buildings
- ❑ Program for energy efficiency improvement in public buildings was approved in Nov. 2014
- ❑ For the implementation of the Program financial engineering instrument consisting EU, State, Municipal and private funds will be used. Starting fund – 50 mill. EUR

***Municipalities** and their administrators already have a competence and experience to take the next step in managing public buildings modernization process.*

# GOAL- QUARTER RENOVATION PILOT PROJECT WITH GERMANY

It is viewed that Energy efficiency improvement programs should include not only renovation of separate buildings, but also upgrade of the entire neighborhoods and their environment, as well as infrastructure. As a result, using experience of other countries, actions are taken to implement a pilot cities quarter energy efficiency improvement project in Lithuania, starting in 2016 in 3 selected municipalities



# FUTURE PLANS

In order to further increase energy efficiency it is planned:

- ❑ to continue implementation of the multi-apartment building renovation (modernisation) programme
- ❑ to start renovating public buildings using the same model as with multi-apartments
- ❑ to make a gradual transition to quarter energy efficiency programs
- ❑ to use innovative solutions for the implementation of projects (introduction of renewable energy use systems; reconstruction of quarter/street lightning systems into more efficient ones etc.)
- ❑ to set up the Leverage fund using EU funds as guarantee in order to attract private banks capital



# Lessons learned (1)

## **A challenge to create a viable financing mechanism:**

- After economic crisis commercial banks are not eager to take risks by providing renovation loans from their own resources, although situation is improving
- State budget has limited resources to subsidise a large share of renovation expenses for a lengthy period

## **Solutions that payed off:**

- Loans from EU Structural Funds (“Jessica” financial instrument) through commercial banks under preferential terms (3 % interest rate)
- 15 % State grant (affordable strain on State finances);
- Additional <25 % grant from Climate Change Program (financing comes from EU emissions trading system)

## Lessons learned (2)

**Challenge** – direct borrowing by apartment owners creates administrative burden to financial intermediaries (assessment of creditworthiness, juvenile or dead owners etc.).

Solution - Administrator or municipal entity can be authorized to take renovation loan on behalf of apartment owners or on his own behalf but for the benefit of apartment owners, bearing the risk.

**Challenge** - Low-income persons are not motivated to invest in renovation.

Solution - 100 % of renovation expenses are covered for low-income persons and a legal provision, stating that in case low-income persons refuse to participate in renovation they could lose from 50% to 100% of subsidies for their energy costs for a period of 3 years.

**Challenge** – Low efficiency of centralized government's efforts to encourage apartment-owners to organize themselves and renovate multi-apartment buildings

Solutions: Involvement of municipalities by empowering them to prepare and implement municipality renovation program (for most inefficient multi-apartment buildings), thus owners do not need to take care of anything, except agree on renovation and pay ordinary bills (loan repayment included in the bill). Making use of the effects of the economies of scale is possible to reduce costs.

## Lessons learned (3)

**Challenge** – Renovation quality – a key concern of apartment owners

Solution - along with the supervision functions performed by relevant Central Government institutions, officers appointed by municipalities will also monitor renovation process. Other discussed possibilities: quality assurance of renovation work; contractor deposit to be returned after successful completion of work; amended construction agreements to withheld 10-15 % of construction price for a year to later remedy construction deficiencies.