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Green Investments for energy efficiency in buildings in Latvia

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Riga Technical university

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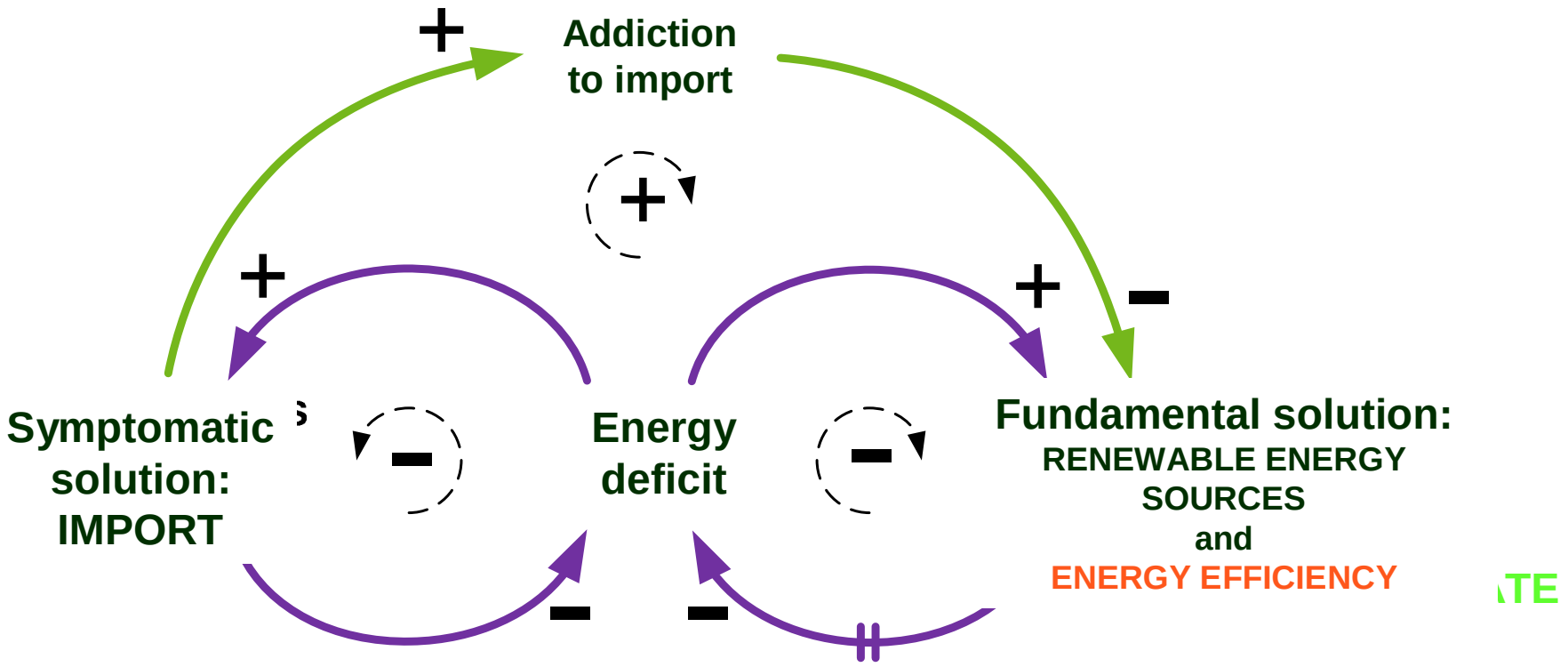
International Expert Conference on Heritage Preservation and Energy Efficiency

Baltic Sea Region Programme 2007-2013

Co2olBricks

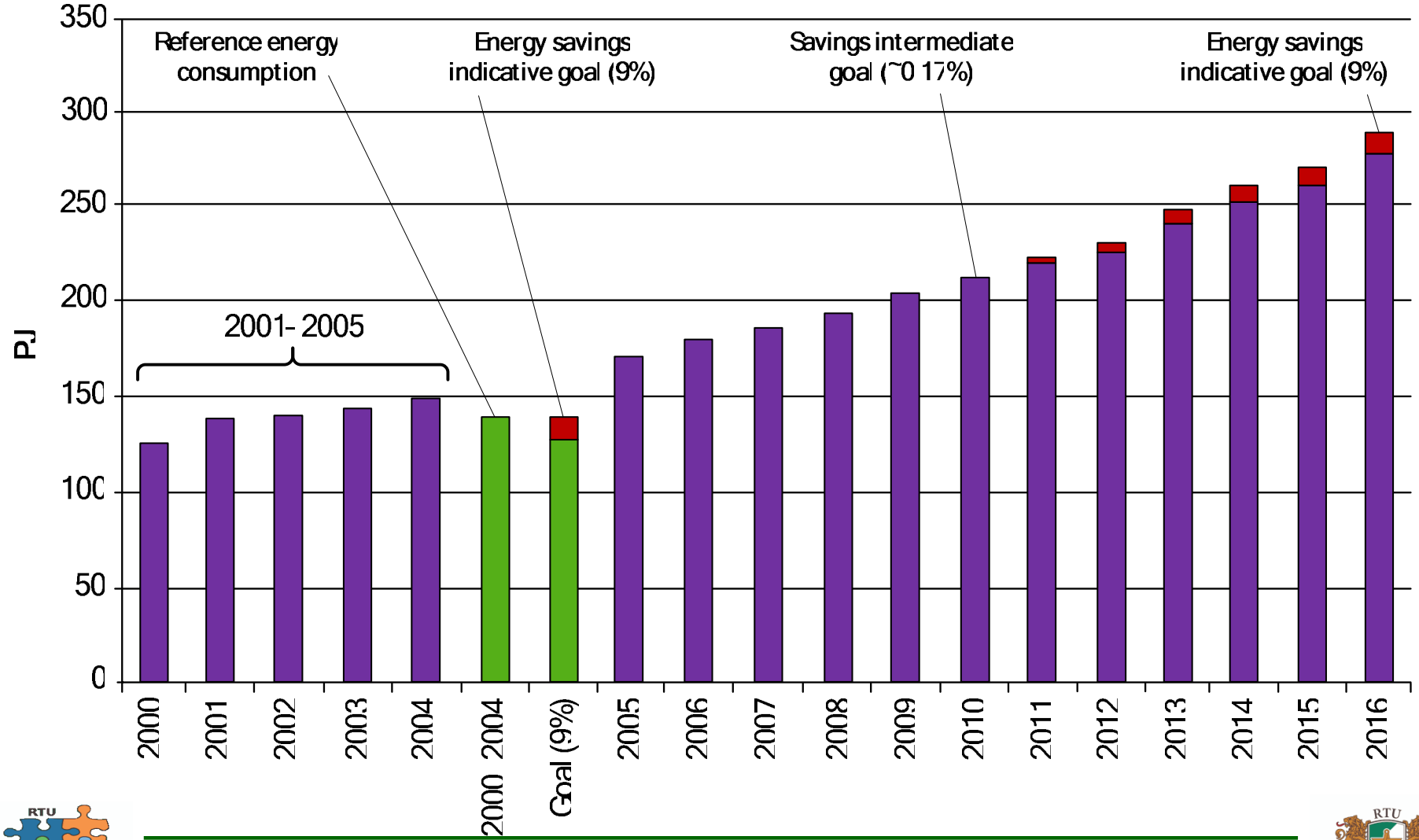
Part financed by the European Union (European Region Development Fund)

System archetype: Energy Addiction



LATVIA'S POLICY ON BUILDING ENERGY EFFICIENCY

National energy end-use and energy efficiency goal



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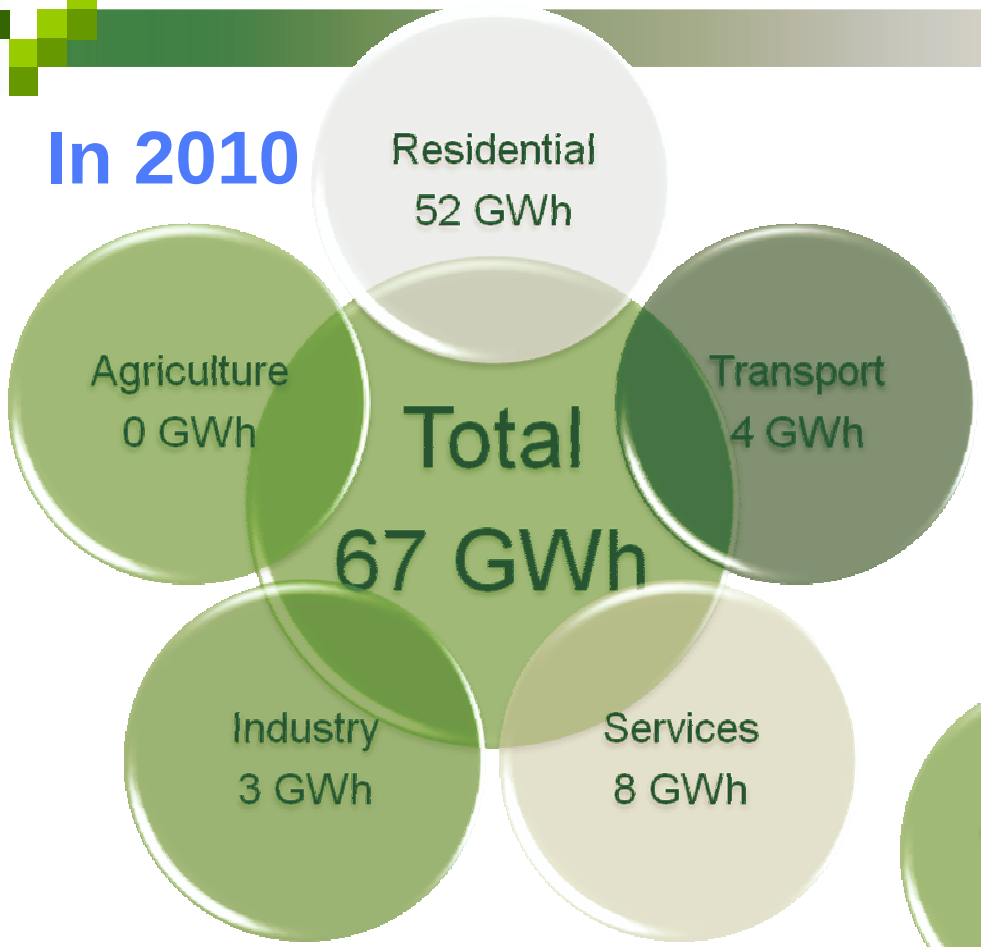
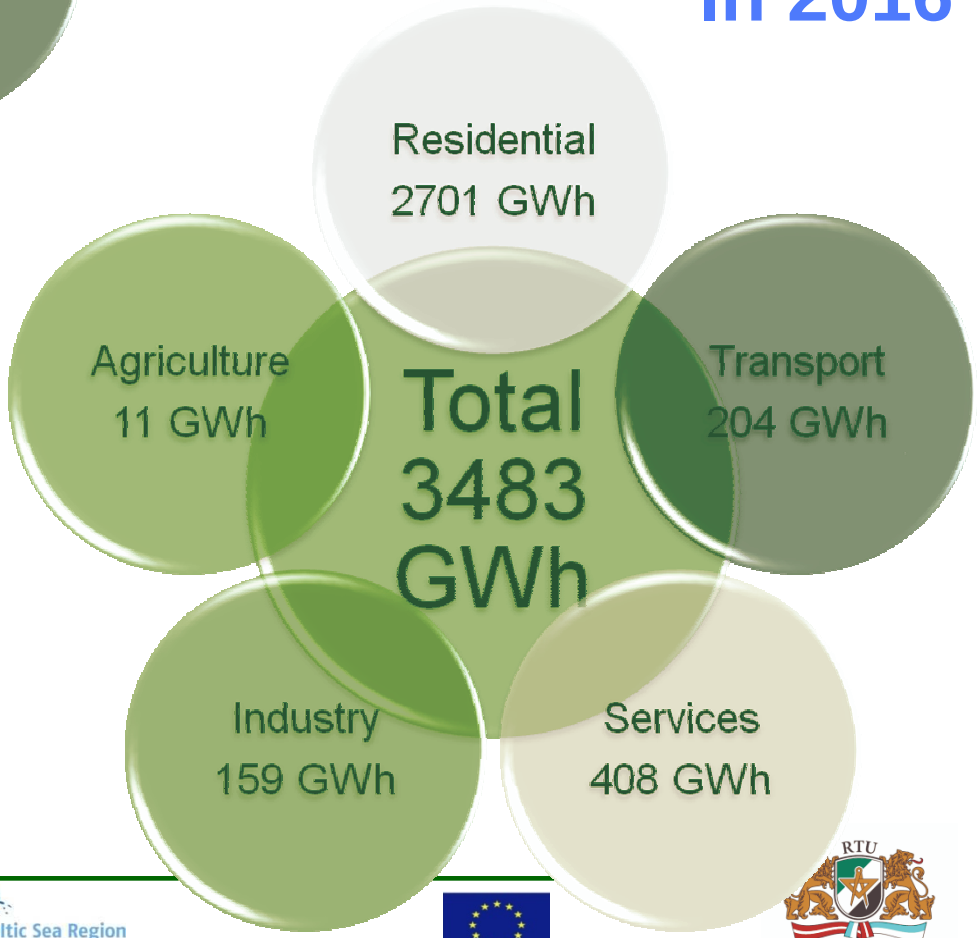
Energy efficiency goals

In 2010



In 2016



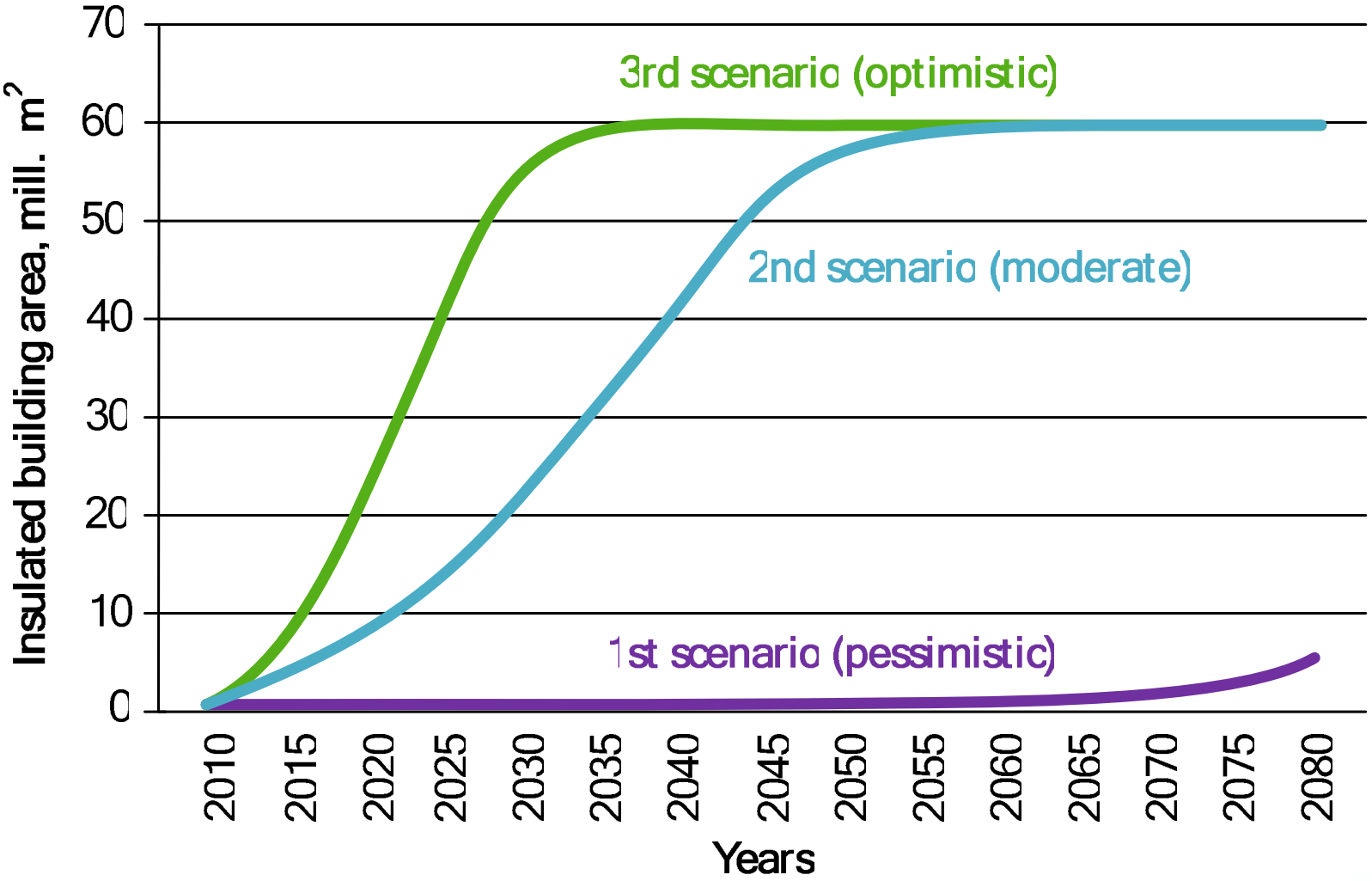
Policy measures in residential sector

- Energy audits in buildings and building energy certification
- Subsidies for energy efficiency measures in multi-apartment buildings
- Informing energy consumers
- Development of secondary legislation

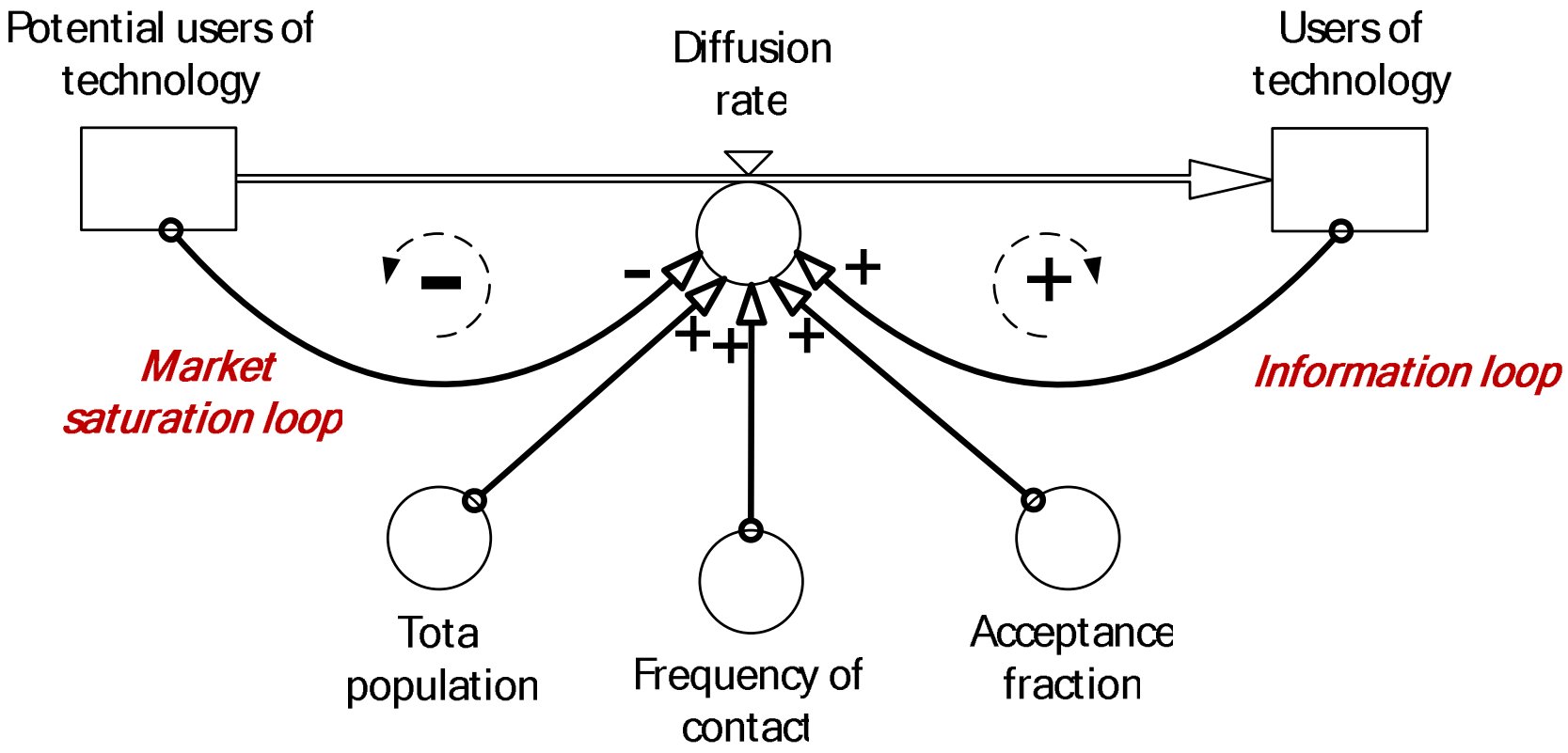
The main dynamic problem

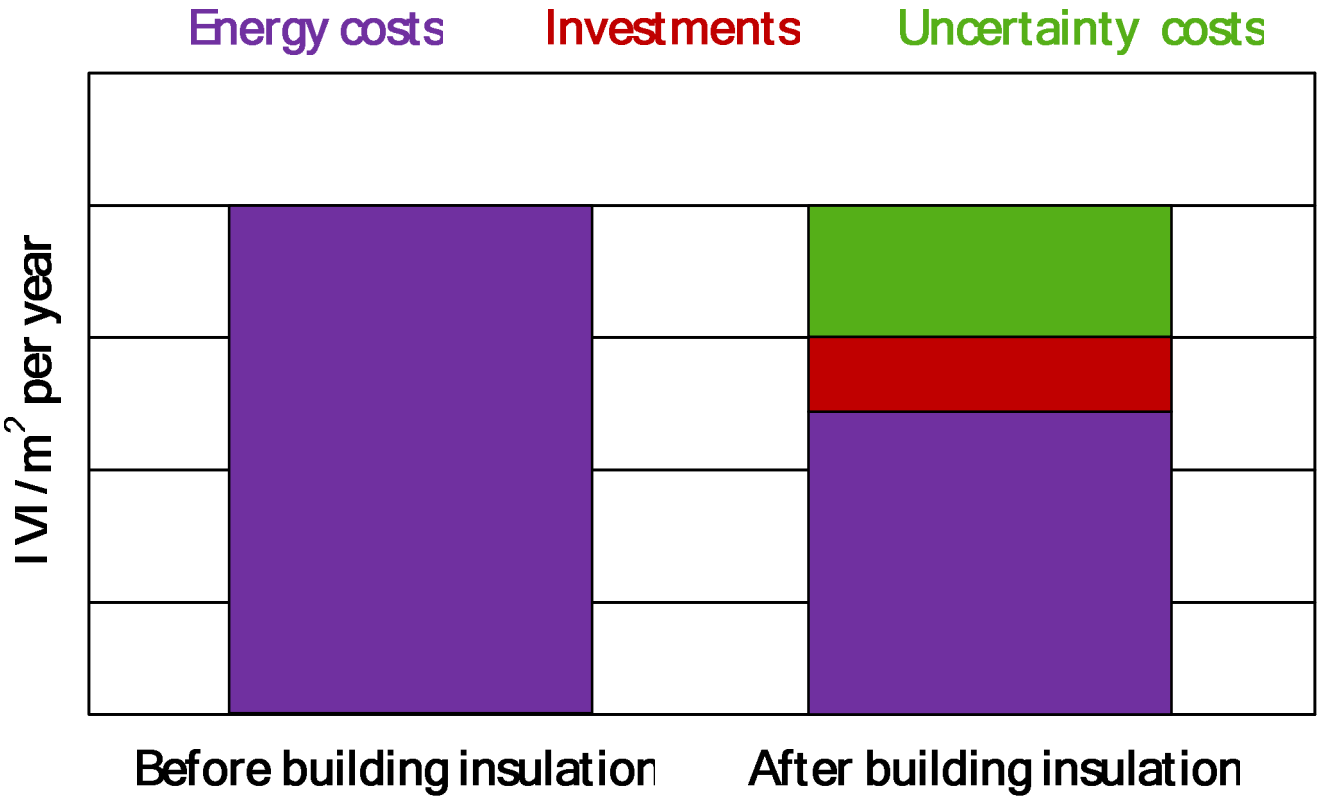
- very little growth in residential building insulation in Latvia:of more than 30,000 multi-apartment buildings, only about 100 buildings have been made fully energy efficient.
- the growth rate has to be increased.

Base scenarios



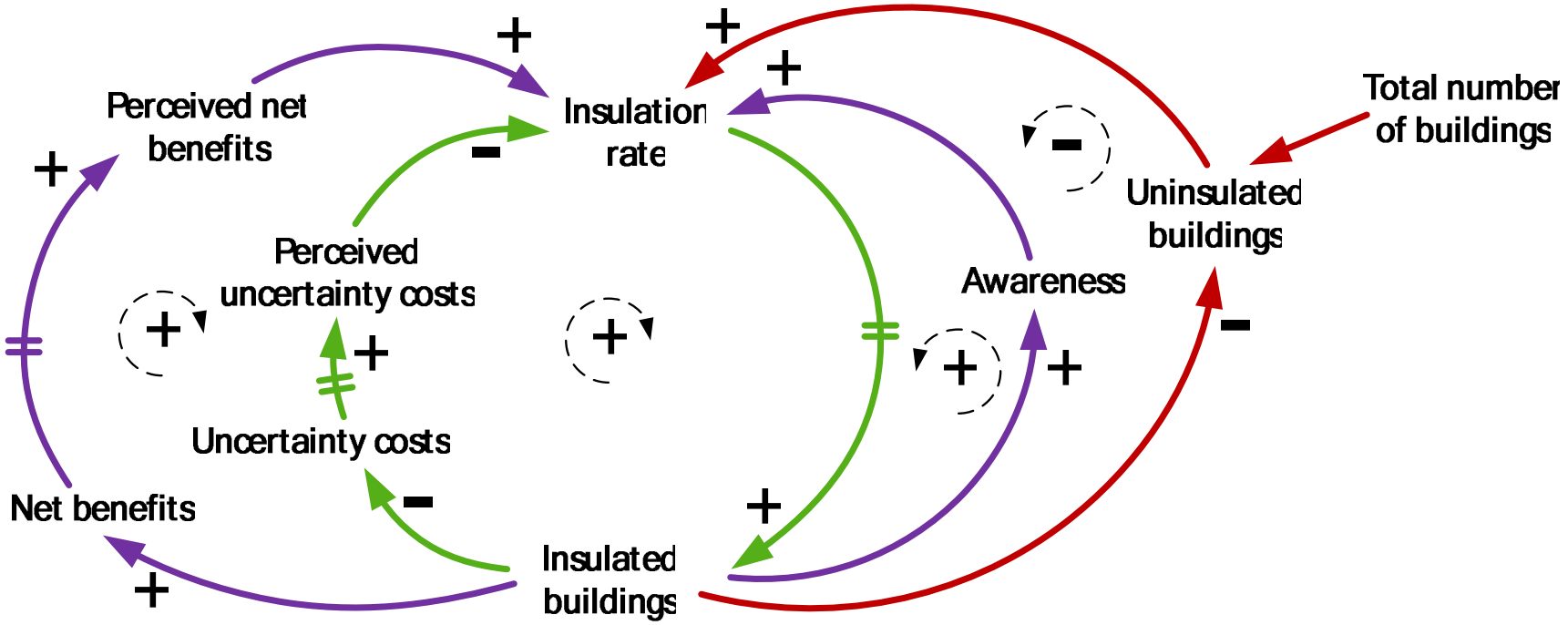
Technology diffusion





1) **Net benefits → max**
2) **Uncertainty costs → min**

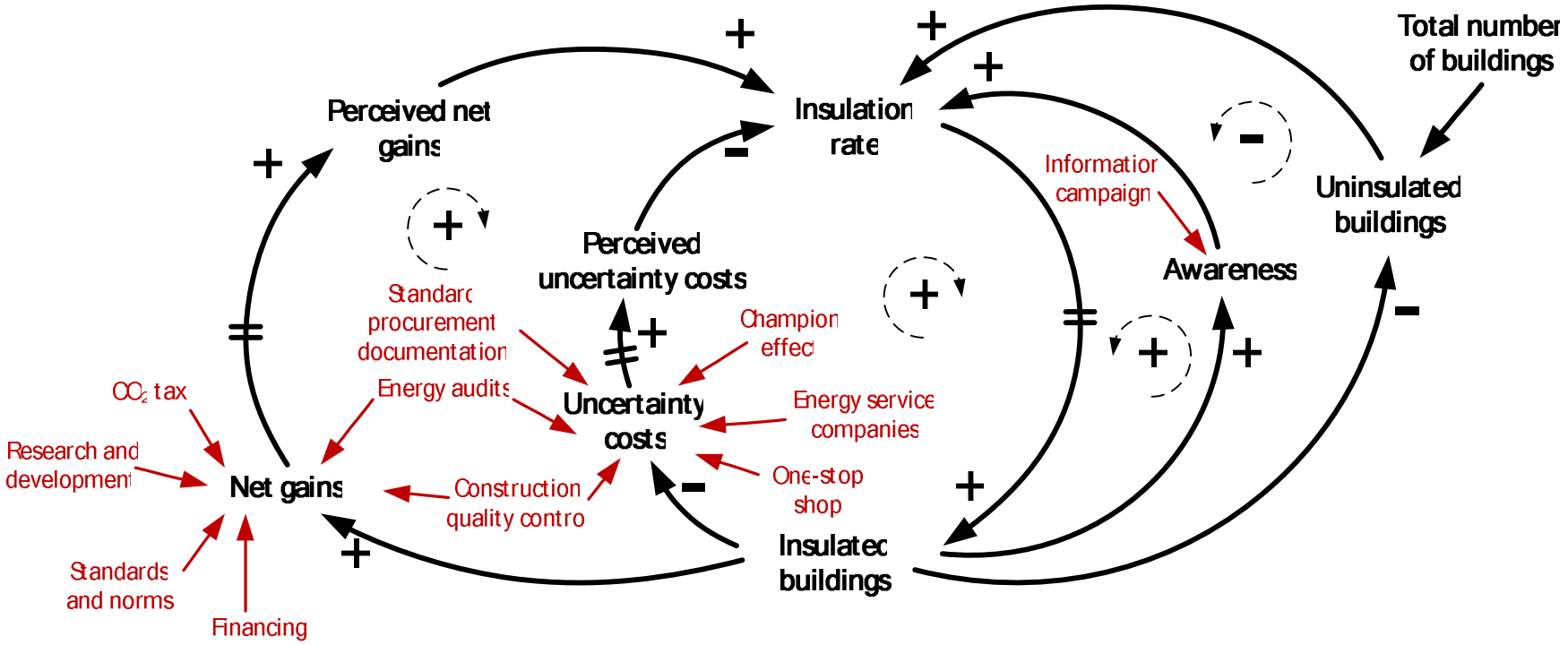
Without energy efficiency policy



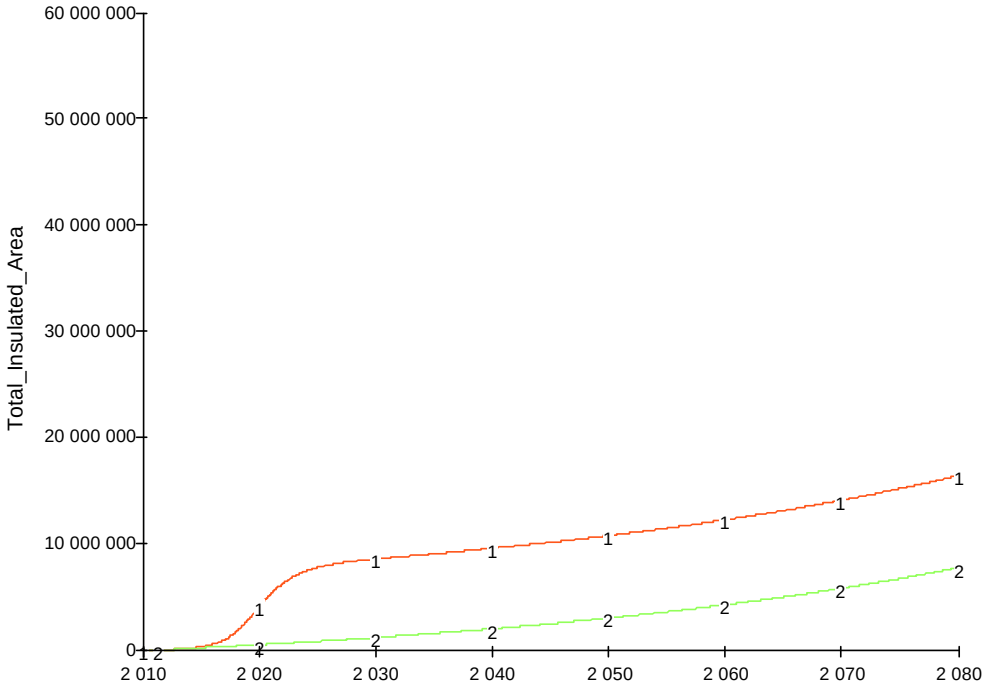
Energy efficiency policy tools used in the system dynamics model

- Energy consumption standarts;
- Quality of energy audits;
- R&D;
- Standard procurement documentation and contracts;
- Quality control of construction works;
- CO_2 tax;
- Subsidies;
- ESCO;
- Information distribution;
- One stop shops;
- Champion effect.

With energy efficiency policy



Existing policy tools



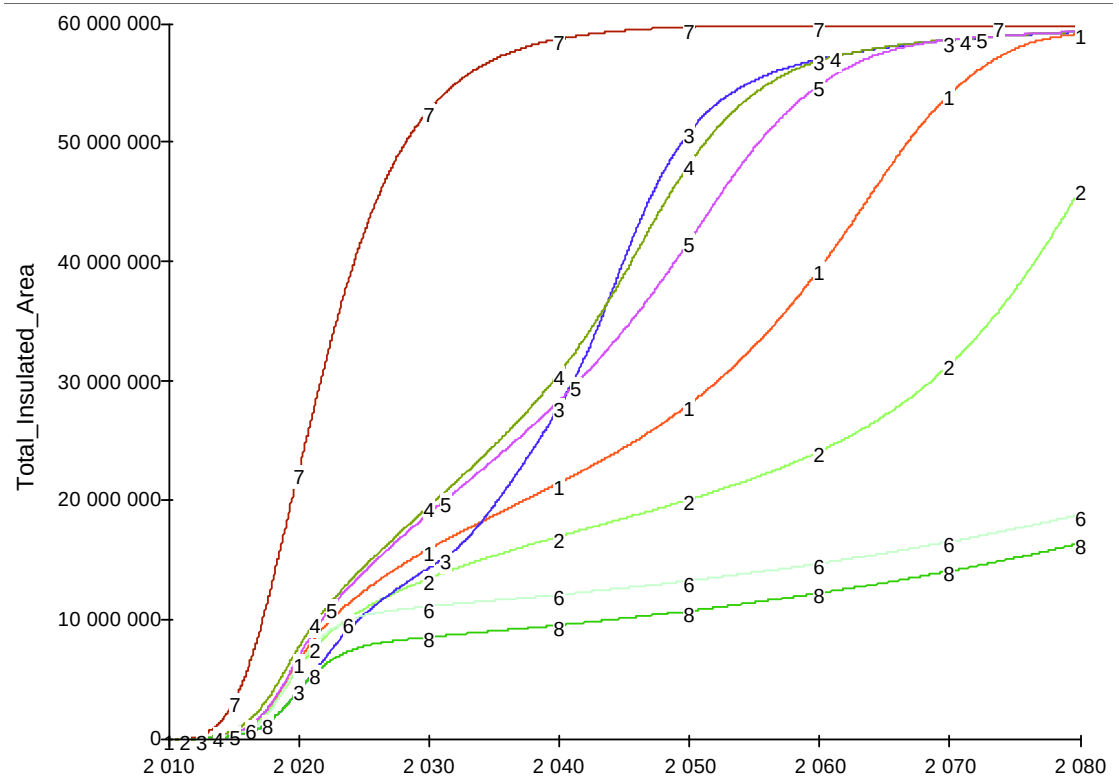
With subsidies (1) and without subsidies (2)

- it is possible to save only 55 GWh until 2016, i.e. 2% of the planned savings.
- the required reduction in consumption using this policy could not even be achieved by 2080.

- Energy audits in buildings and building energy certification
- Subsidies for energy efficiency measures in multi-apartment buildings
- Informing energy consumers
- Development of secondary legislation

With energy efficiency policy

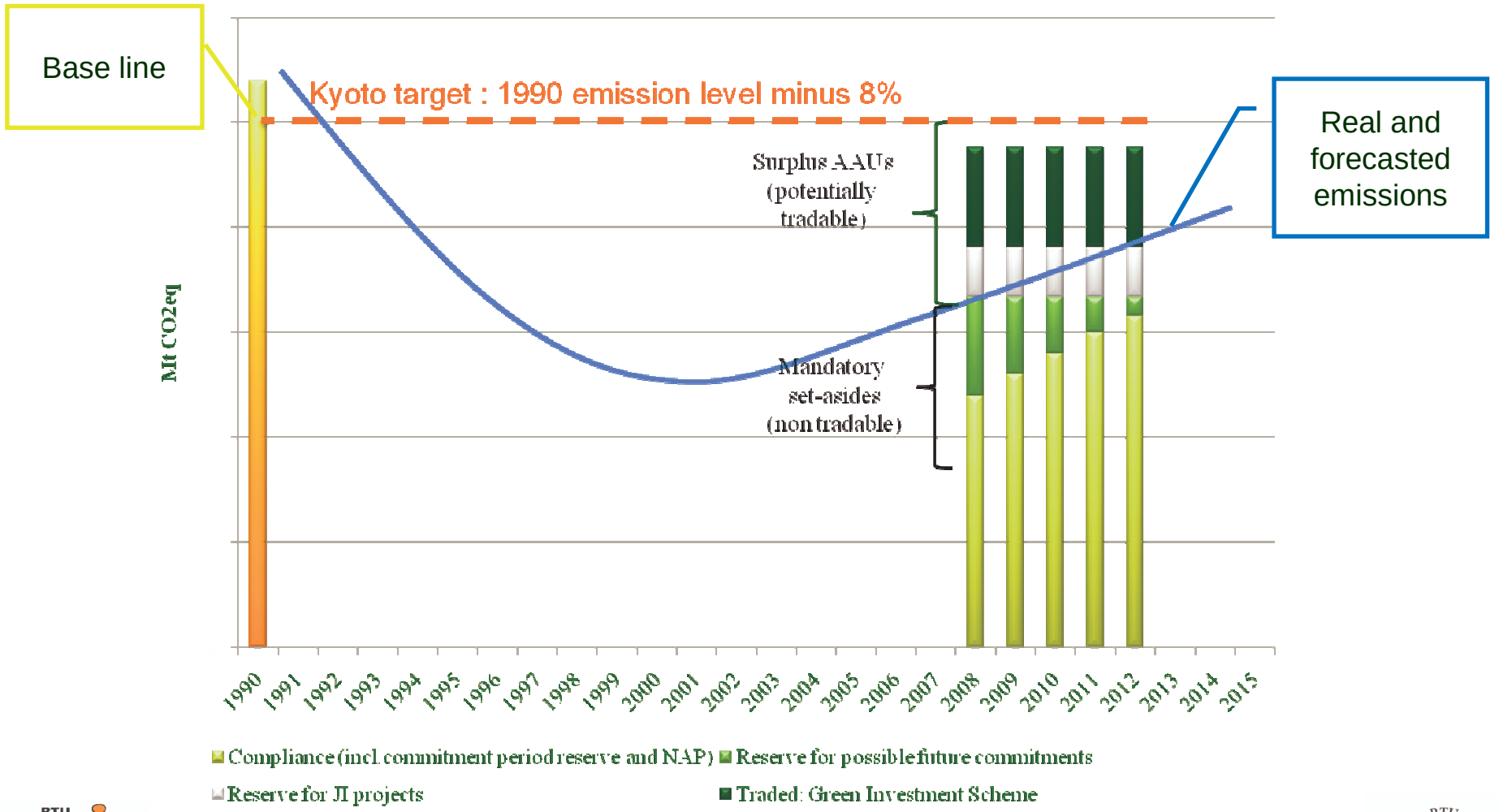
No	Energy efficiency policy	Implementation of First Energy Efficiency Action Plan, %
1.	Development of one-stop shop	3.3 %
2.	Introduction of CO_2	3.2 %
3.	Increase in minimum energy efficiency requirements	2.0 %
4.	Increase in research and development support	5.6 %
5.	Development of standard procurement documentation and	3.5 %
6.	Introduction of information campaign	2.5 %
7.	All energy efficiency policies	21.6 %
8.	Only subsidies	2.0 %



- it is possible to save only 583 GWh by 2016, i.e. 21.6% of the planned savings.
- the required reduction in consumption using this policy could only be achieved by 2020.

GREEN INVESTMENT SCHEME

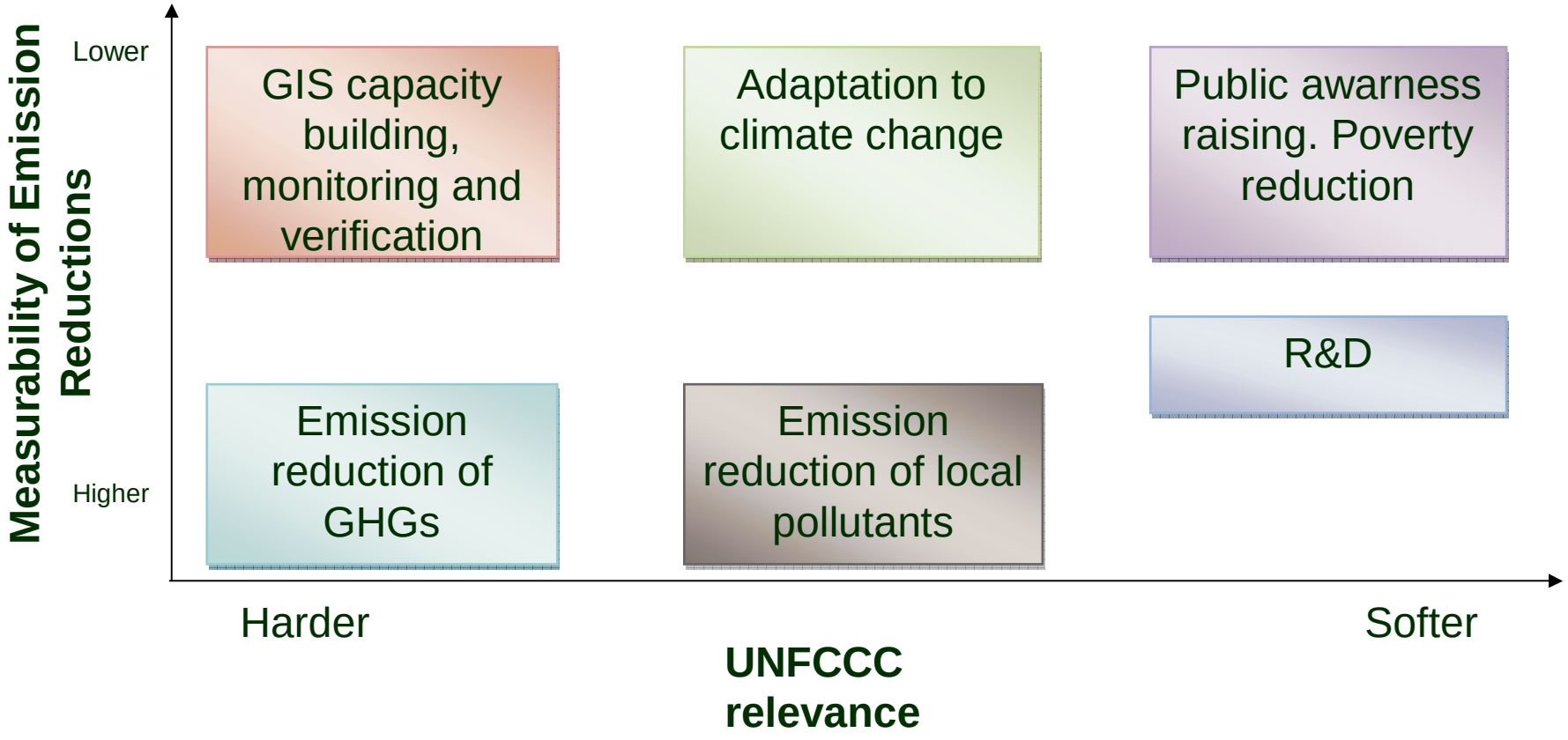
Latvia and the Kyoto protocol target



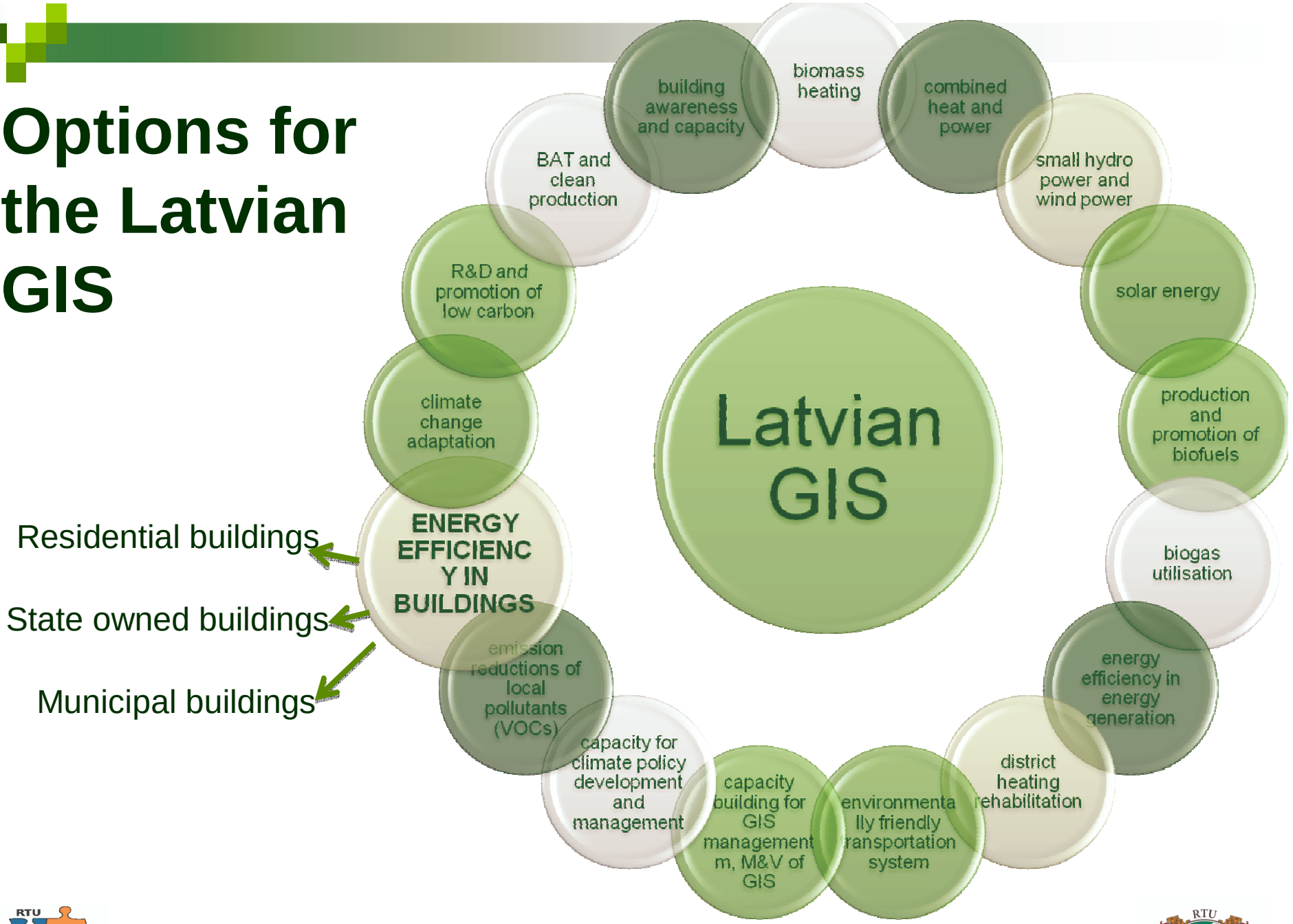
Green Investment Schemes

1. GIS - mechanisms established by the selling countries to assure buyers that AAU (assigned amount unit) proceeds **are used to finance agreed environmental projects and programs**.
2. Buyers and sellers can embed greening activities in AAU purchase **agreements.**
3. **Monitoring and verification** measures need to be adopted to ensure accountability for expenditure outcomes, credibility, and transparency.

Relative positions of greening activities



Options for the Latvian GIS



Subsidies allocation for buildings

Cost Benefit Ratio

- **$kgCO_2/EUR\ year$** – kg of CO_2 reduced annualy over the subsidy amount of investment costs

Those with a higher cost benefit ratio receive a higher score during evaluation.

‘GREEN INVESTMENT SCHEME’ SUBSIDIES FOR ENERGY EFFICIENCY PROJECT IN HISTORICAL BUILDING

RTU VASSI

Co2olBricks

Baltic Sea Region Programme 2007-2013

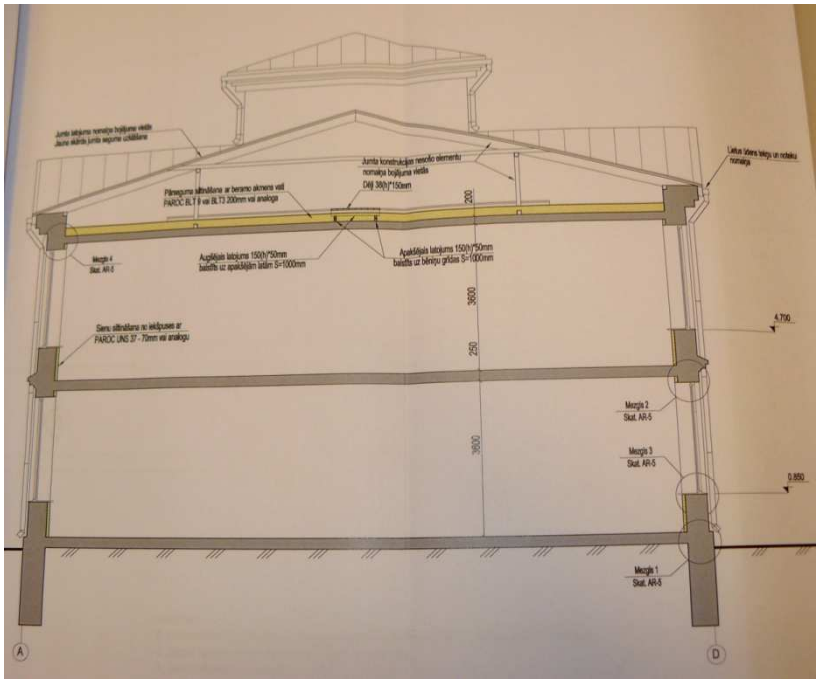
RTU

Energy efficiency in historical building: Liepaja Art School

- Built in 1870;
- Total area: 1324 m^2;
- Heated area: 1290,5 m^2
- 3 floors;
- Applied for GIS subsidies

Energy efficiency measures: Liepaja Art School

- Wall insulation from inside with mineral wool (70 mm)
- Damaged bricks have to be fixed before renovation
- Attic insulation with mineral wool 200 mm
- New heating system with thermoregulators on every radiator



Energy consumption and CO_2 emissions: Liepaja Art School

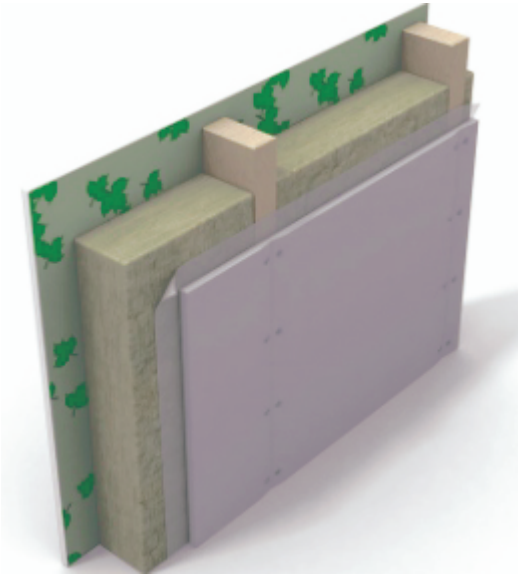
- Boiler house with natural gas;
- Heating consumption:
  - before: 156 kWh/m^2 year;
  - after (calculated): 98 kWh/m^2 year;
  - **savings (calculated): 29%**
- Total investments: 69175 EUR;
- GIS subsidy: 50%;
- **Min cost-benefit ratio for eligibility: 0,5 kgCO_2/EUR**
- **0,57 kgCO_2/EUR**
- Did not get GIS subsidies in the first round of the call for proposals.

Energy efficiency in historical building: Riga, Melnsila 7

- Architect Janis Alksnis;
- Built in 1902;
- Traditional eclecticism style;
- Built as tenement for factory workers;
- Renovated in 2007;
- Originally 2 floor building, during renovation 2 floors added.

Energy efficiency in historical building: Riga, Melnsila 7

- Insulation with mineralwool (5 cm) from inside;
- Gas boilers in every flat;
- No data available about energy consumption before and after renovation.



Source: www.paroc.lv