



# Energy efficiency and renewable energy sources status regarding Riga city Sustainable Energy Action Plan

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# City of Riga

- City of Riga:
  - area 307km<sup>2</sup>;
  - population 650 640;
  - population density 2 119 residents/km<sup>2</sup>.



# Riga city Sustainable Energy Action Plan 2010-2020 (SEAP)

- Riga – as the first capital city - signed The Covenant of Mayors in September, 2008 and assumed an obligation

**20-20-20 at 2020**

- SEAP was approved by the Riga City Council in 2010
- The first progress report of the SEAP was worked up in 2011. There was pointed out that CO<sub>2</sub> emissions decreased by **49%** compare to the 1990. The second progress report of the SEAP - which was worked up in 2012 – outlined CO<sub>2</sub> emissions reduction by **>50%** compare to the 1990.

# Riga SEAP structure



## Main chapters:

- Emissions inventory, base year choice, emissions forecast until 2020,
- Energy consumption reduction and EE improvement measures,
- RES use

## Chapters of supporting measures:

- Management structures of Riga SEAP implementation,
- Society involvement in the SEAP implementation,
- Possible financial tools and necessary funding for SEAP implementation,
- EU, state and local government supporting measures,
- Necessary regulations and laws for SEAP implementation

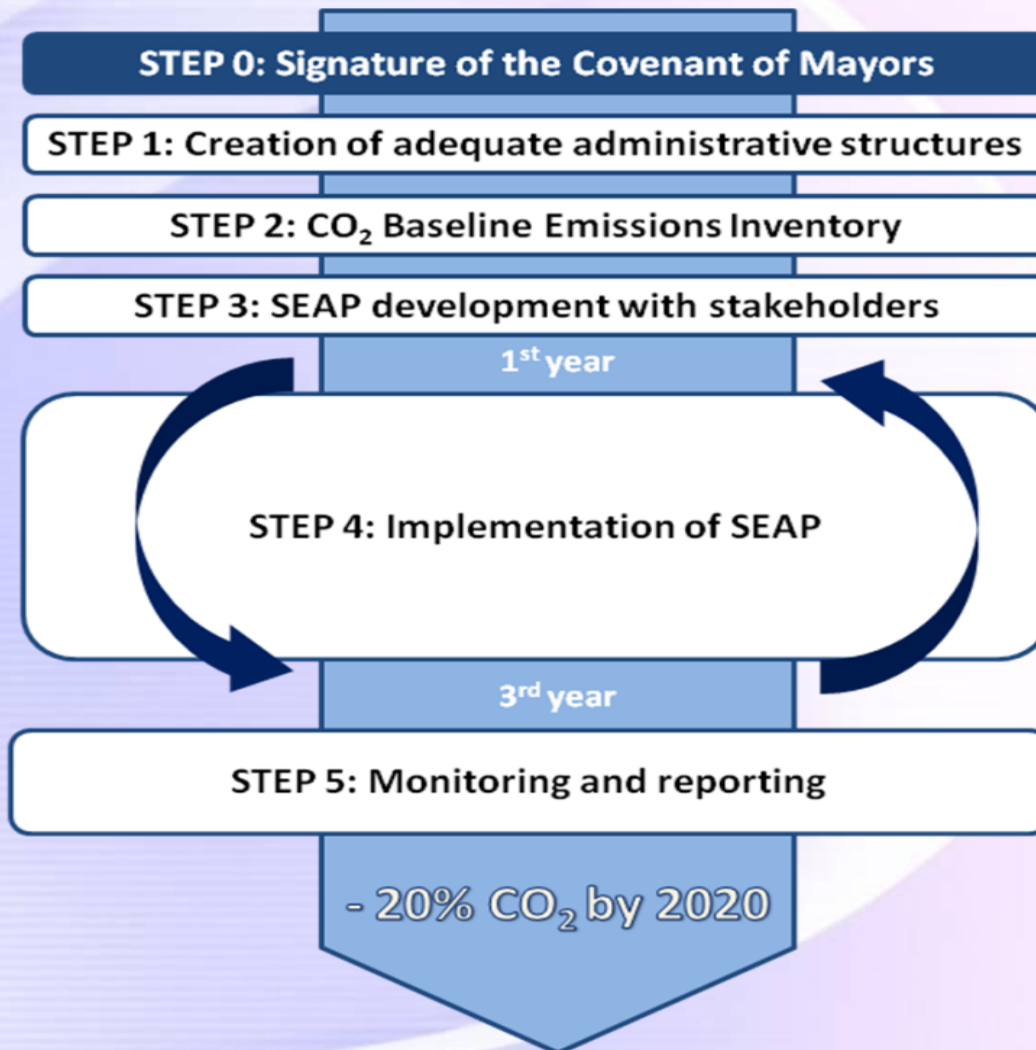


# Potential sources of funding of energy efficient renovation of buildings (SEAP)



<p>Complex renovation of multi-apartment buildings</p>	<p>Structural Funds, loan resources, revolving fund, national and municipality aid measures, ESCO, MESCO</p>
<p>Complex renovation of municipal public buildings in Riga</p>	<p>Funding from the flexible mechanisms of the Kyoto Protocol, budget of the municipality</p>

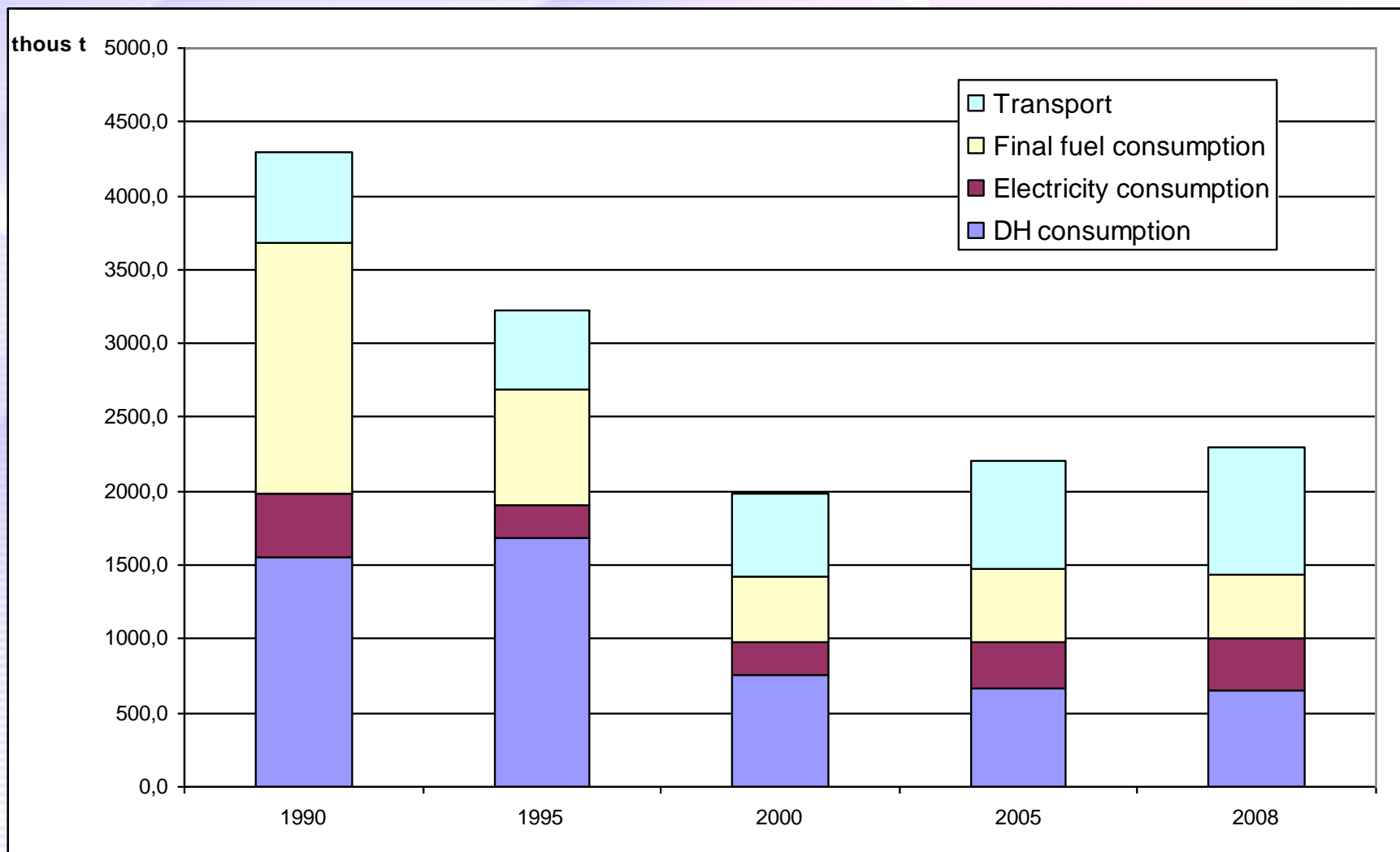
# Tools: SEAP & CO<sub>2</sub> Baseline Inventory



## The baseline CO<sub>2</sub> emission Inventory for Riga

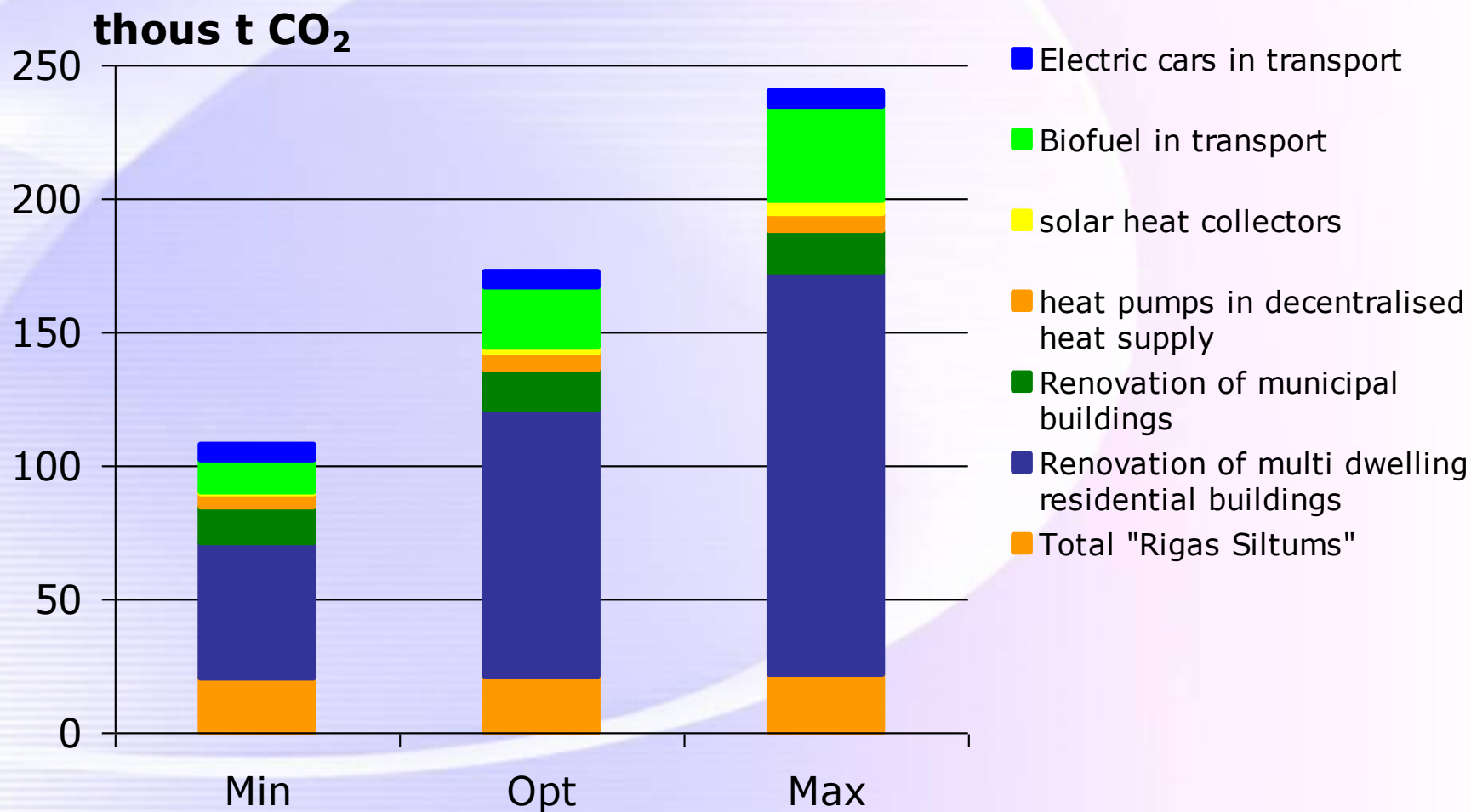
- The baseline emission have been calculated for year 1990; 1995; 2005; 2008 (CO<sub>2</sub> emissions);
- Projection of emissions for year 2010; 2015 and 2020 have been evaluated;
- Standard emission factors in line with the IPCC principles have been chosen;
- Country specific CO<sub>2</sub> EF for primary energy have been implemented

# Calculated CO<sub>2</sub> emissions in Riga 1990 -2008

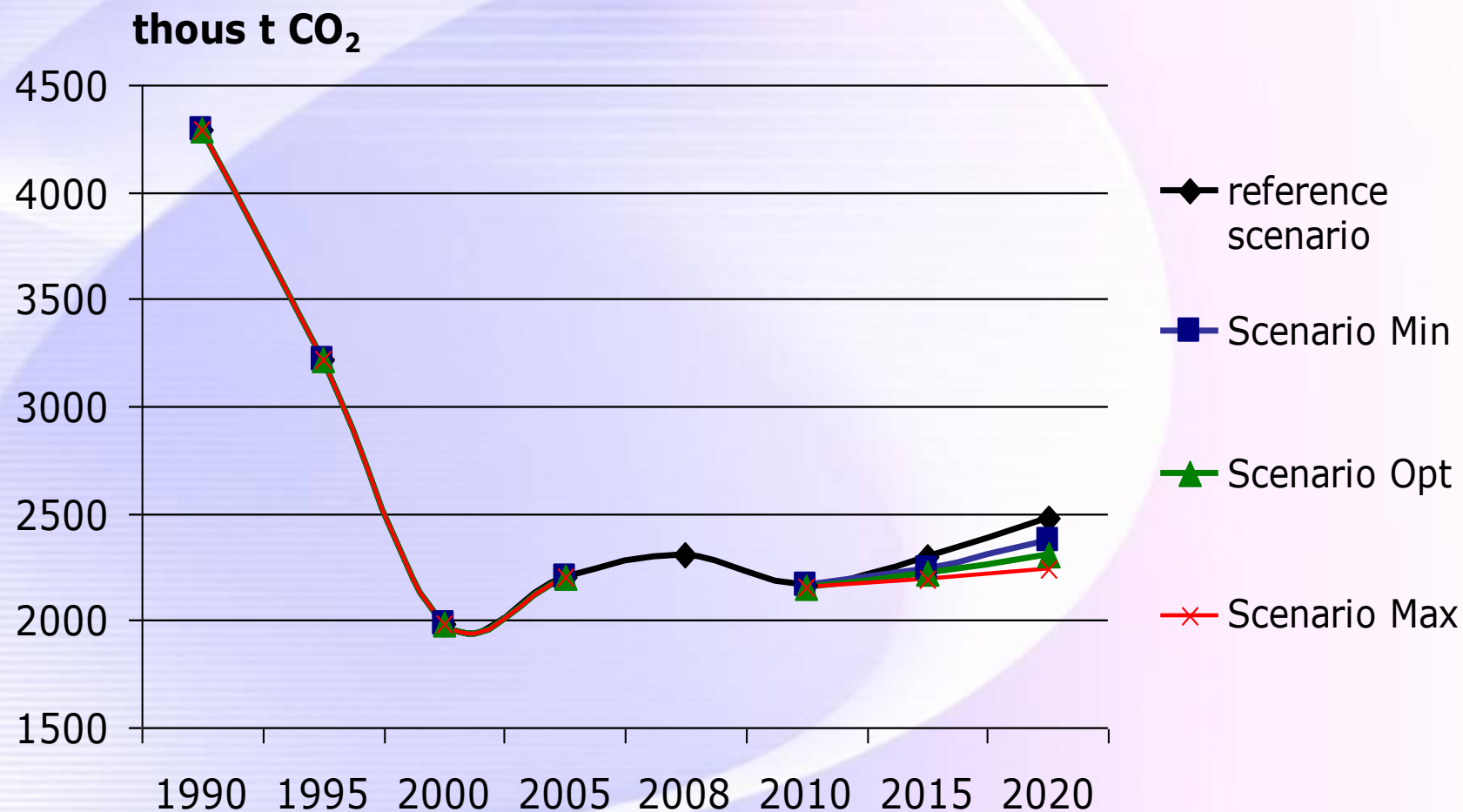




## Evaluated potential of demand side emission reduction measures, year 2020



## Projected CO<sub>2</sub> emissions in Riga for different scenarios



# Energy consumption reduction and EE improvement measures (SEAP)

## ☐ Energy production and supply sector:

- Heat supply
- Electricity supply
- Fuel consumption, incl. decentralized heat supply.

## ☐ Energy consuming (demand side) sector:

- City housing sector
- Public buildings sector of the city
- Streets and parks lighting
- The public transport of the city.

## ☐ Urban development planning measures for energy consumption reduction.







## Energy efficiency improvement measures in the DH system



☐ Flue gas condensing equipment installation in heat plants for flue gas heat utilization

☐ EE improvement in the CHP “Imanta” by installation of absorption type heat pump (2 MW)

### Key rehabilitation measures of DH system:

- decommissioning of central heat substations(185)
- installation of prefabricated building heat substations (>8.000)
- heat distribution network rehabilitation by use of prefabricated isolated pipes
- **heat meters remote reading introduction for heat billing & energy management needs (8.000 pcs)**



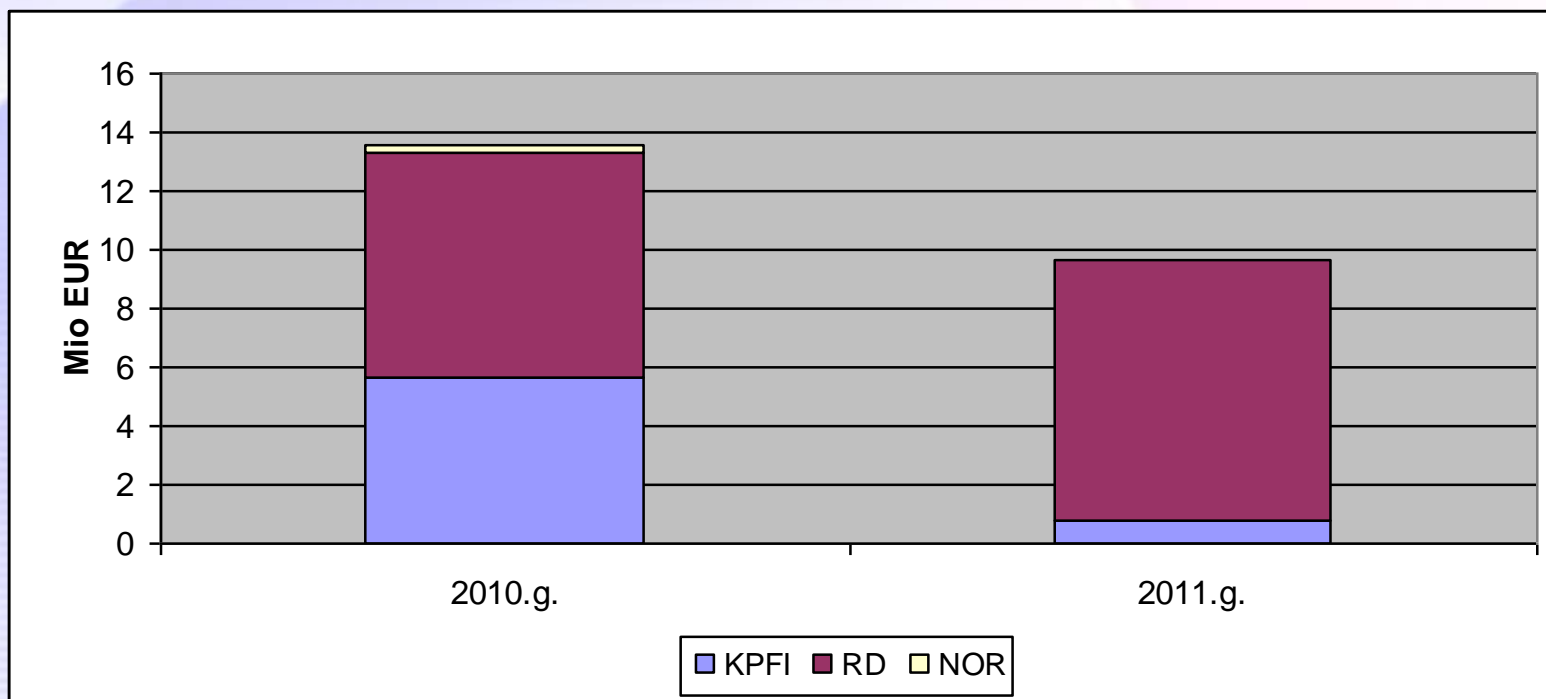


## Main demand side measures for EE improvement & CO<sub>2</sub> emission reduction in Riga

Measure	Energy saving or substitution, year 2020, Max scenario, GWh
Renovation of multi-apartment residential buildings	780
Renovation of municipal buildings	81
Solar collectors in decentralized heat supply	25
Heat pumps in decentralized heat supply	48
Biofuel for transport	330

# Refurbishment of Riga city public buildings - annual energy savings of around 12,5 thous. MWh

Investments in energy efficient refurbishment of public buildings – schools and kindergartens



100 - number of Riga city public buildings which were refurbished until 2013

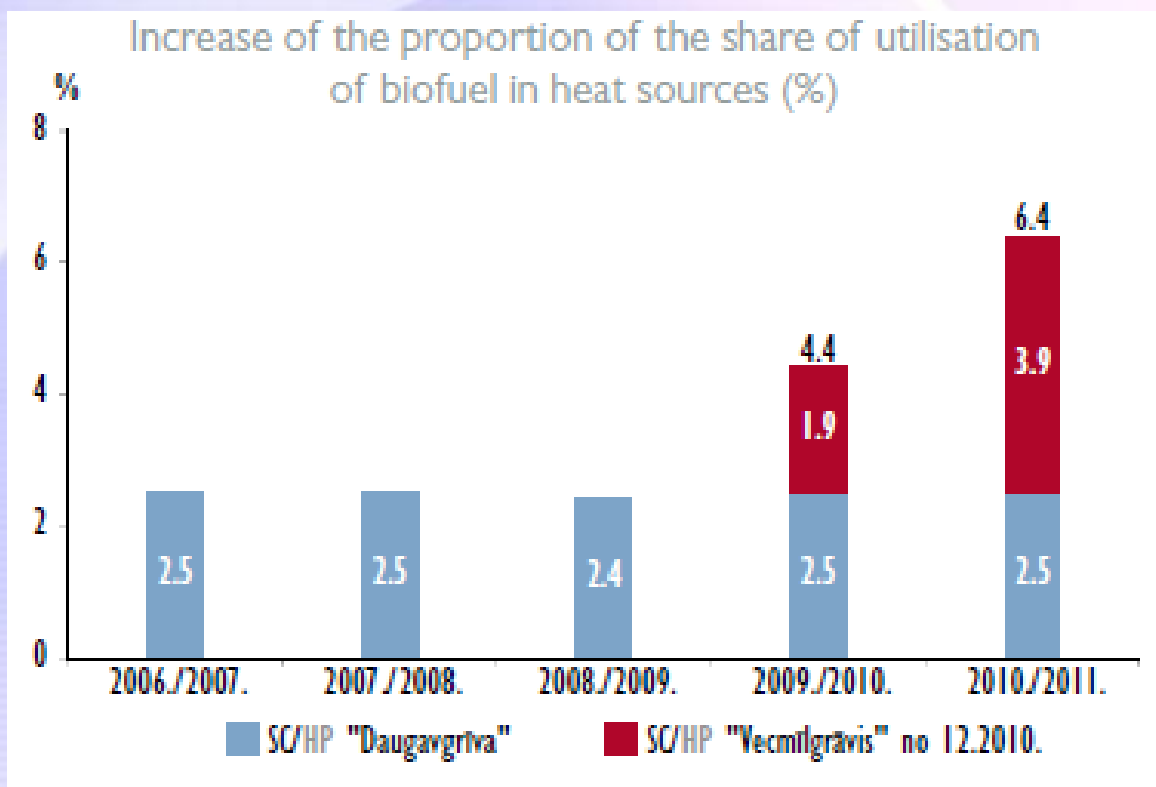
## RES use in Riga:

- hydroenergy – Riga HES (Daugava cascade) connected to the power supply system of Riga
- biogas
- solid biomass
- subsurface ground heat
- solar energy
- electric cars



## Solid biomass – wood chips

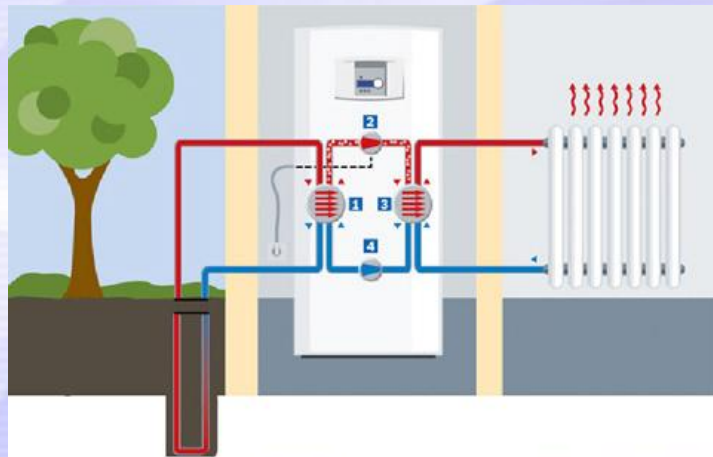
JSC “Rīgas siltums” - main operator of centralized district heat supply in Riga



The target – increase the share of solid biomass up to the 20% in the heat supplier fuel balance before the year 2015

# SUBSURFACE GROUND HEAT

Riga municipality installed space heating based on the ground heat pumps in the two kindergartens, thereby closed the two coal-fired boiler houses:



**Kindergarten “Kastanītis”** –  
10 thermal probes in vertical  
boreholes with depth –  
120m;

Two stage heat pump 57,5  
kW





# ELECTRIC CARS IN RIGA

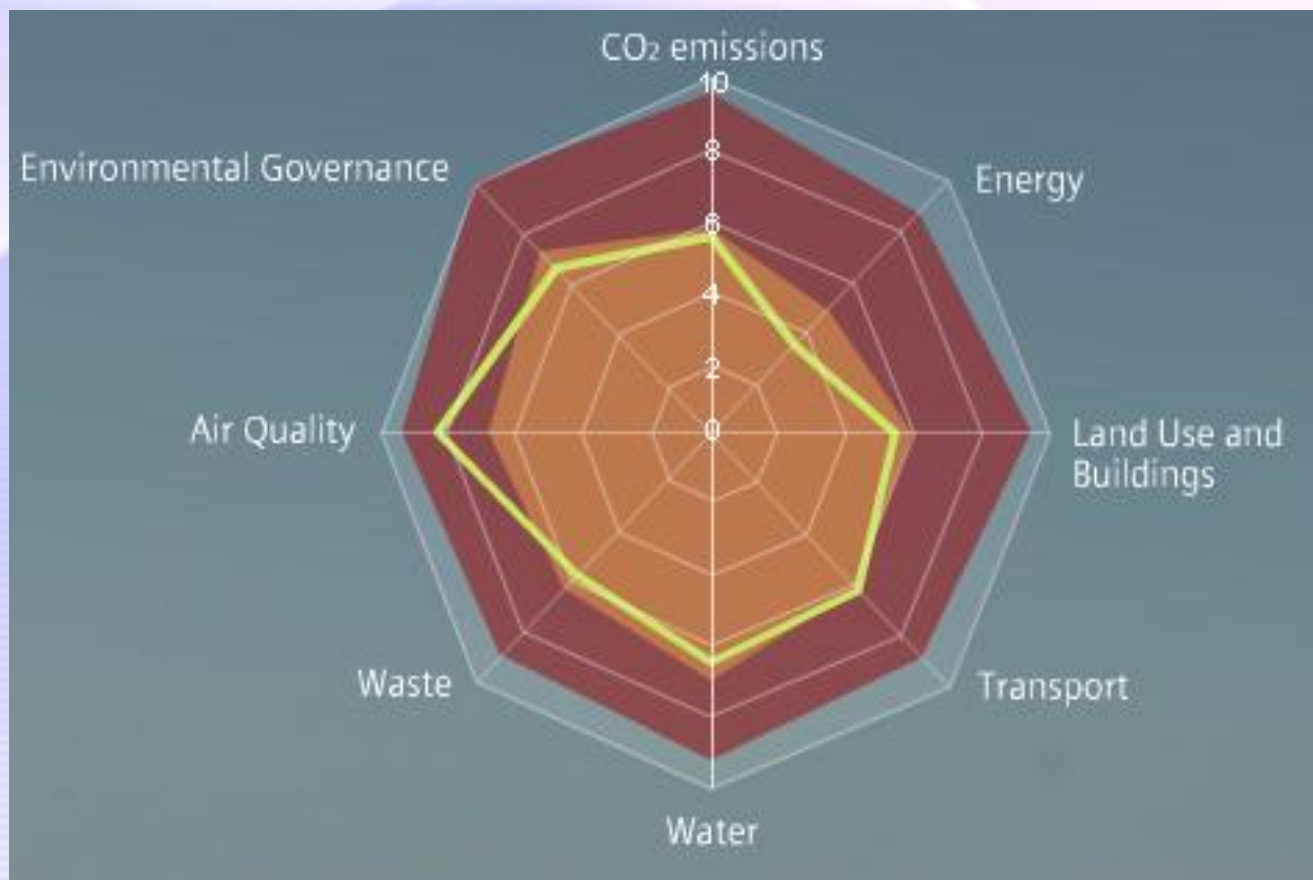
First in Latvia registered electric cars (9) are in Riga, incl.:

- Riga municipality – 6 pcs;
- JSC “Latvenergo” – 2 pcs
- electric cars sales dealer – 1 pcs



There was registered in Riga also the car with both electrical and gasoline engines, which is worlds famous OSCAR - first electric car – participant of Dacara international rally competitions

## EU “green city” index of Riga (Siemens evaluation)



# Upgrading SEAP: roadmap to the status of smart city



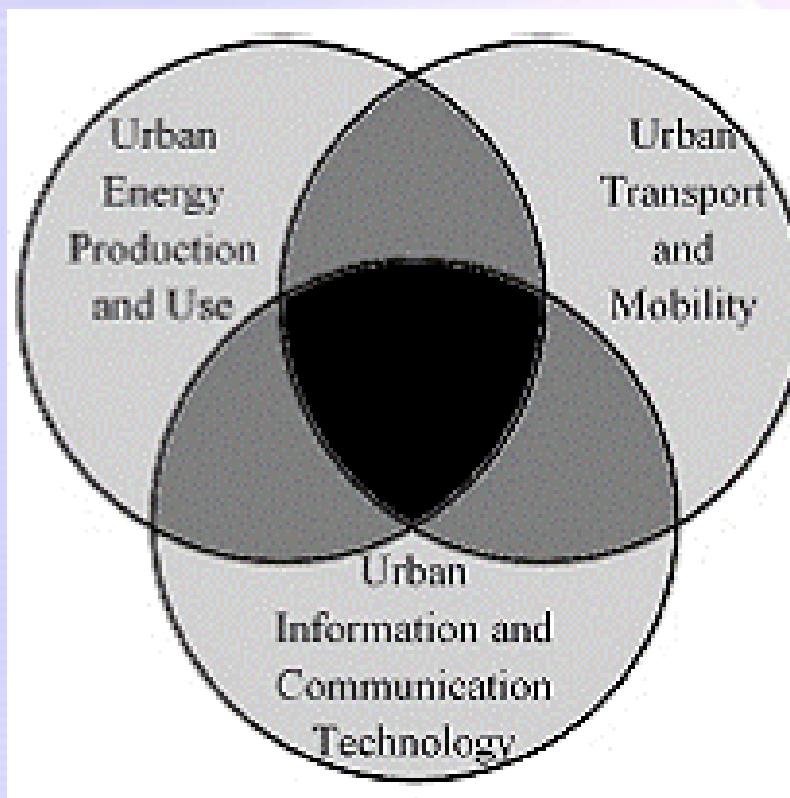
## *Example of data remote reading for commercial invoices preparation*

**System provides automatic remote reading of heat consumption data from 8.000 heat meters**

- **No necessity of monthly visits of consumer substations in order to make manual records of heat meters data**
- **No necessity of manual data input into system interface**
- **Data automatic input transmittance allows automatic preparation of consumers invoices**
- **Remote evaluation possibility of heat consumption**

**The project is realized by Ltd. “Citrus Solutions” together with Miltel Communications, which provides management software, the installation and construction of all equipments, both base stations and end-connection devices, as well as overall project management and integration.**

## SMART CITIES partnership in cities and regions covers three sectors





## **Hydrogen in the city: smart technology for smart city**

**International Conference “Hydrogen technology  
opportunities for sustainable development of cities”  
Riga, 20.03.2013**



**Thank you for your kind  
attention!**

<http://www.rea.riga.lv>