

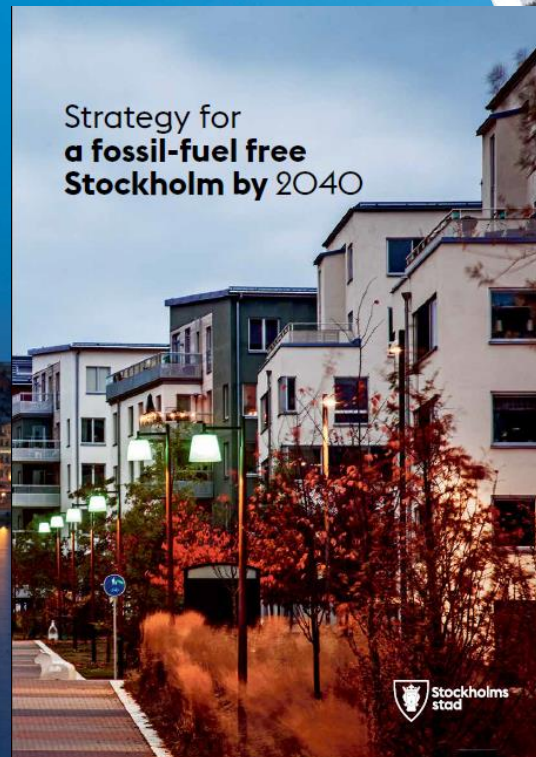
# Stockholm

## Fossil fuel free 2040



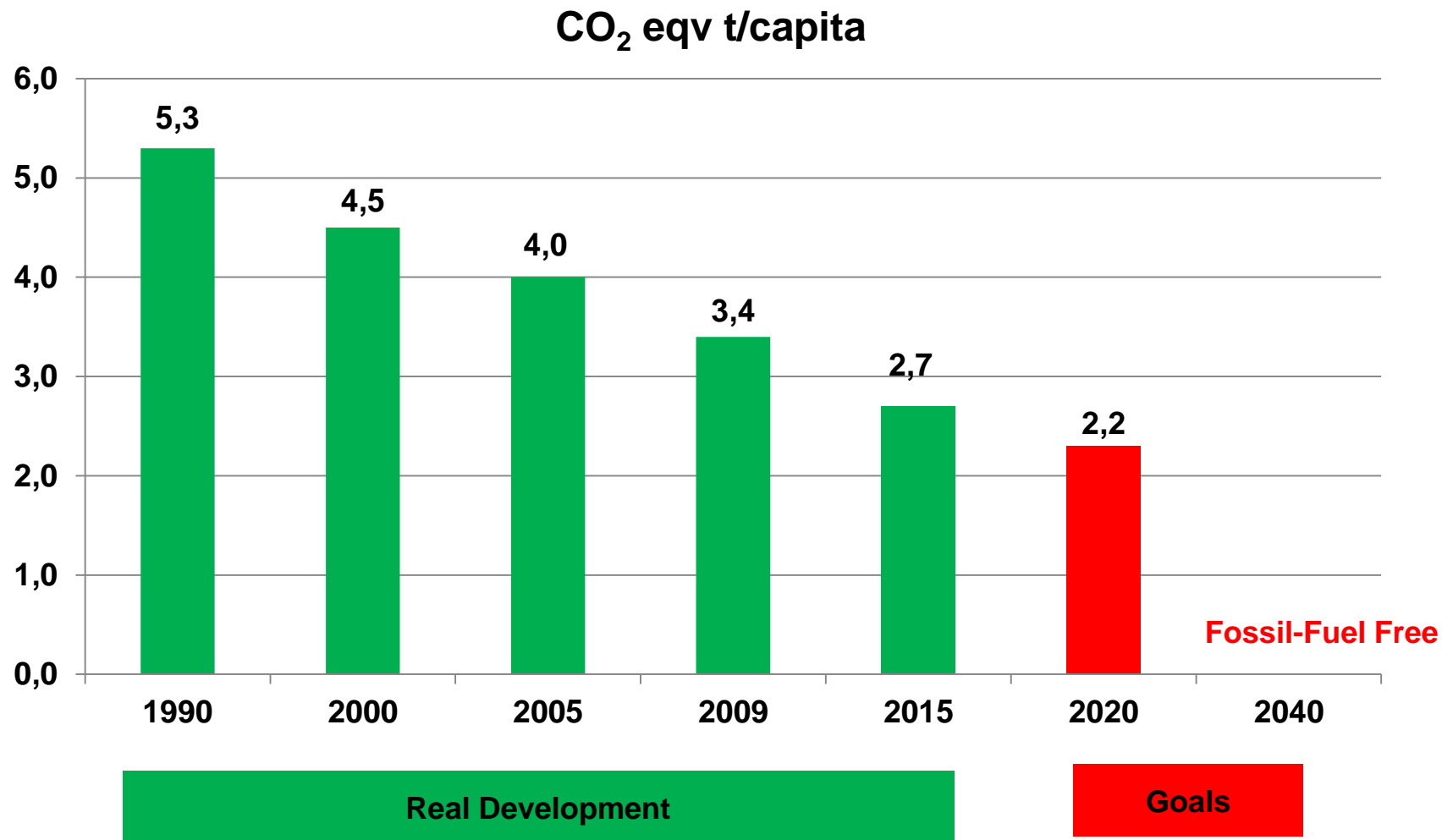
The Capital of Scandinavia

# Climate work since 1995

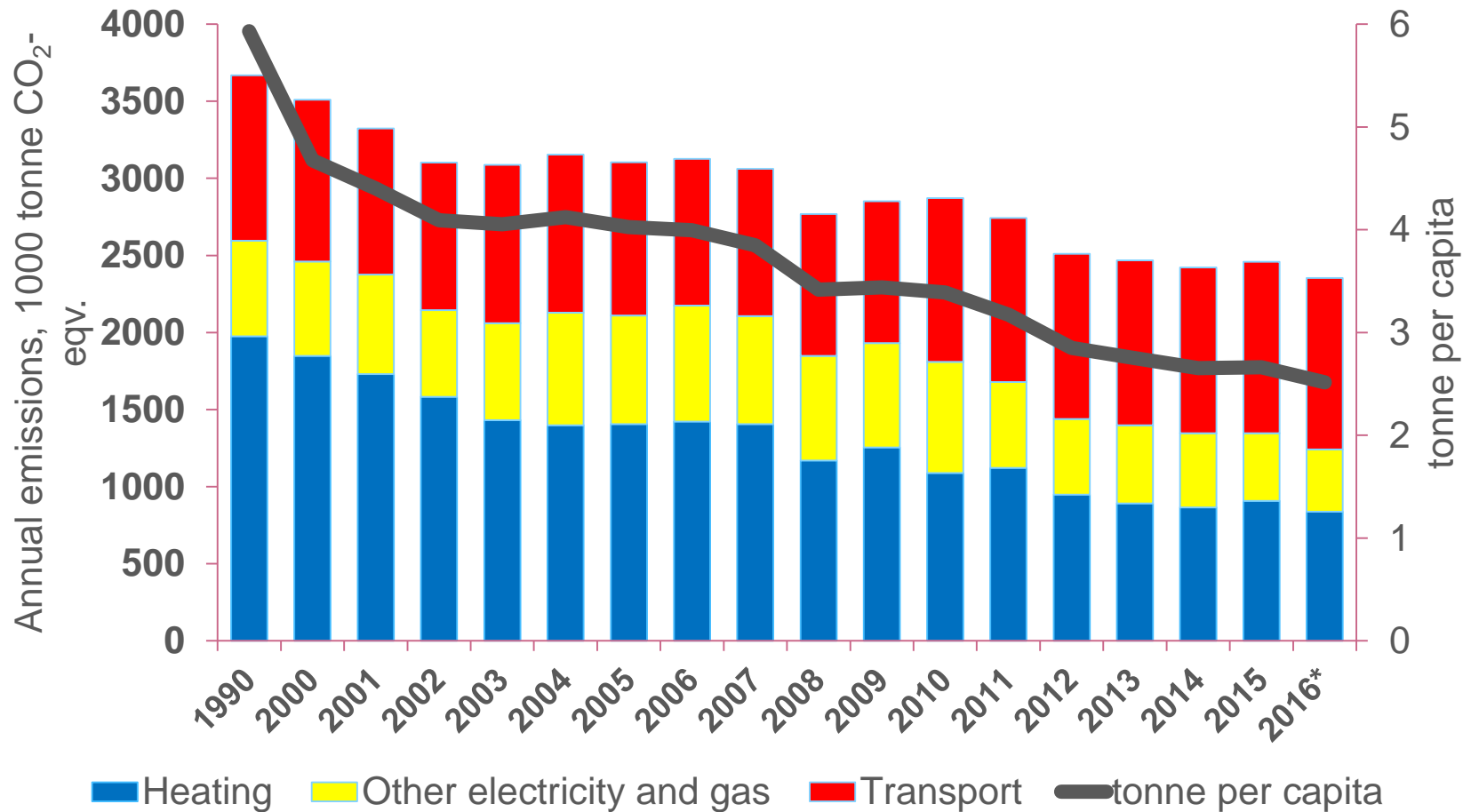


The Capital of Scandinavia

# Goals and achievements



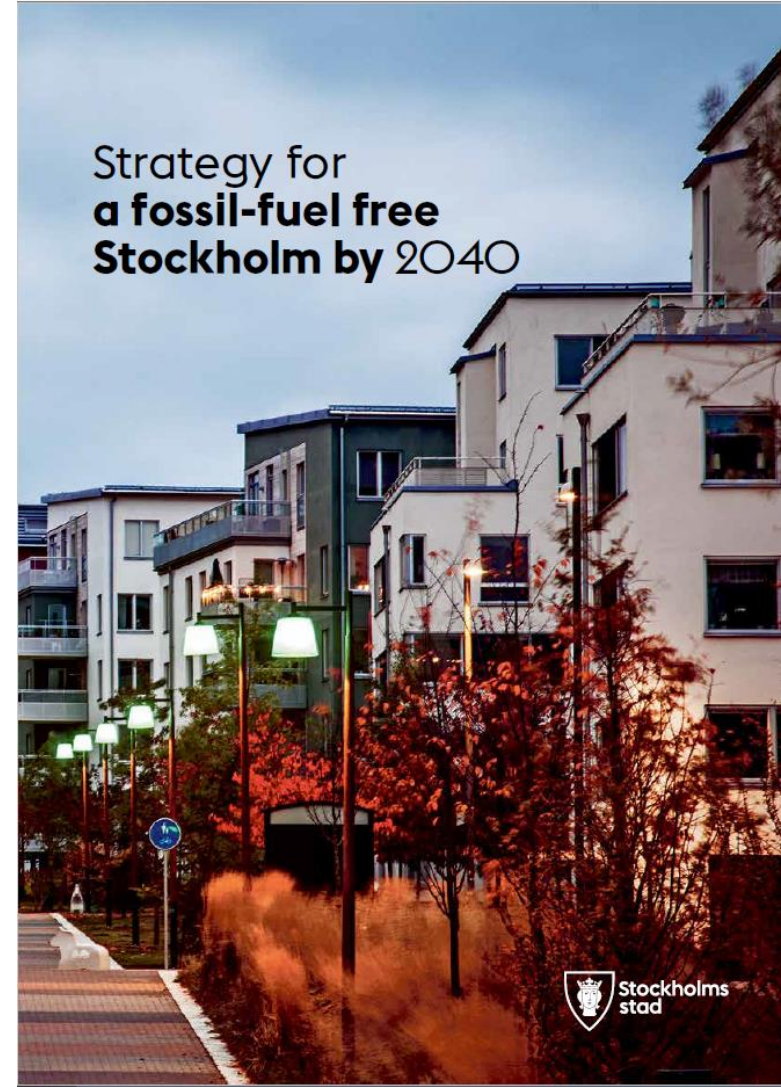
# Annual emissions of CO<sub>2</sub> -eqv





# Fossil fuel free Stockholm 2040

- Decided actions to 2020
- Strategic decisions for 2040



# Buildings

heat-hot water & cooling



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# The present CHP system

Market share >80 %

Fossil fuel <20 %

Electricity production eqv  
1/5 of Stockholms use

New market solutions



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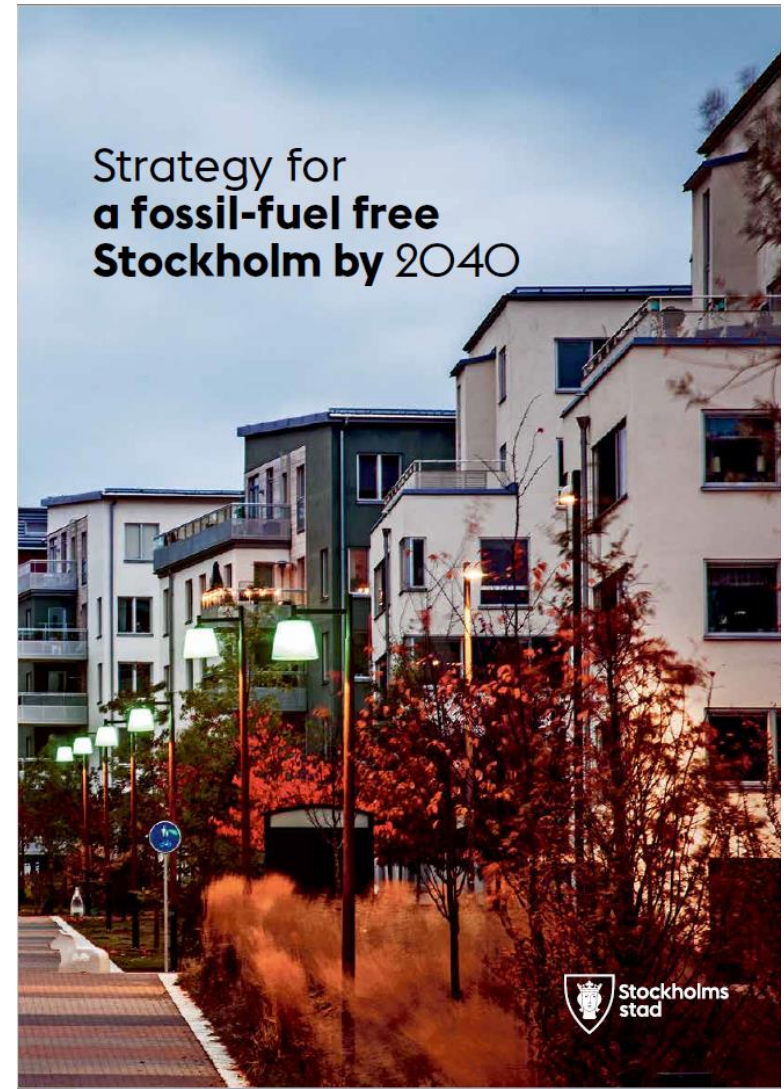
# Heating– measures to 2020

**New biofuel powered CHP plant & Increased number of district heating users – also for providers of heat**

**Increased energy efficiency in city owned buildings 10%**

**When renovating city owned buildings -30 % in energy use**

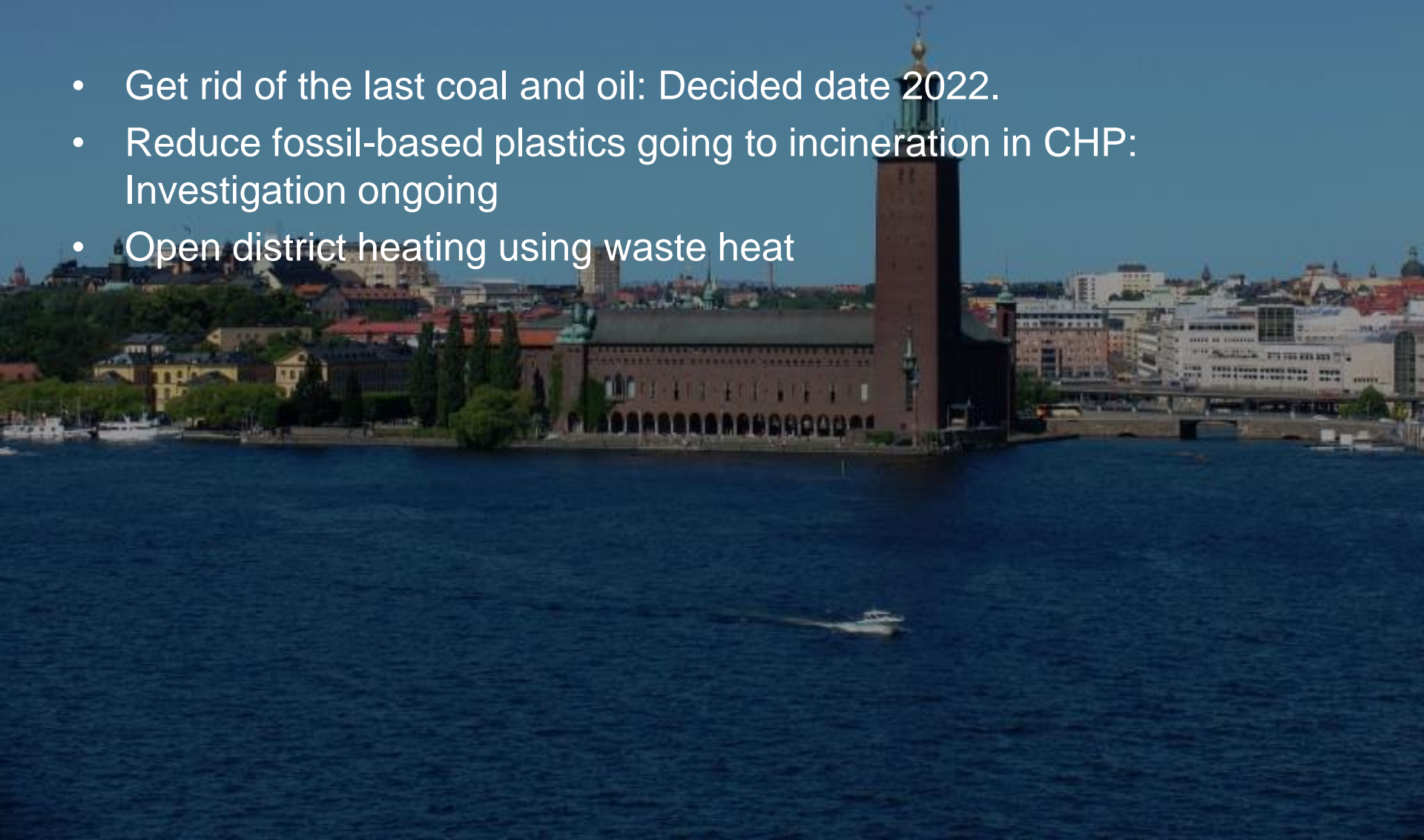
**Energy standards in building contracts on city owned land 55 KWH/m<sup>2</sup>**





# Strategic work on buildings and energy systems to 2040

- Get rid of the last coal and oil: Decided date 2022.
- Reduce fossil-based plastics going to incineration in CHP: Investigation ongoing
- Open district heating using waste heat



# Residential buildings



ENVIRONMENT AND HEALTH  
ADMINISTRATION  
ENERGICENTRUM  
104 20 Stockholm

Energicentrum at the City of Stockholm Environment and Health Administration

## The economics of renovation projects with energyrelated investments

Final report

15 February 2012



ÅF Infrastructure AB  
Karin Byman  
Sara Jernelius



# Energy efficient renovation methods

- Mechanical ventilation with heat recovery by heat-pump
- Heat recovery from waste-water
- Improved thermal insulation of walls and roofs
- New windows with low U-values
- Fine tuning of systems

Sustainable Järva -50%

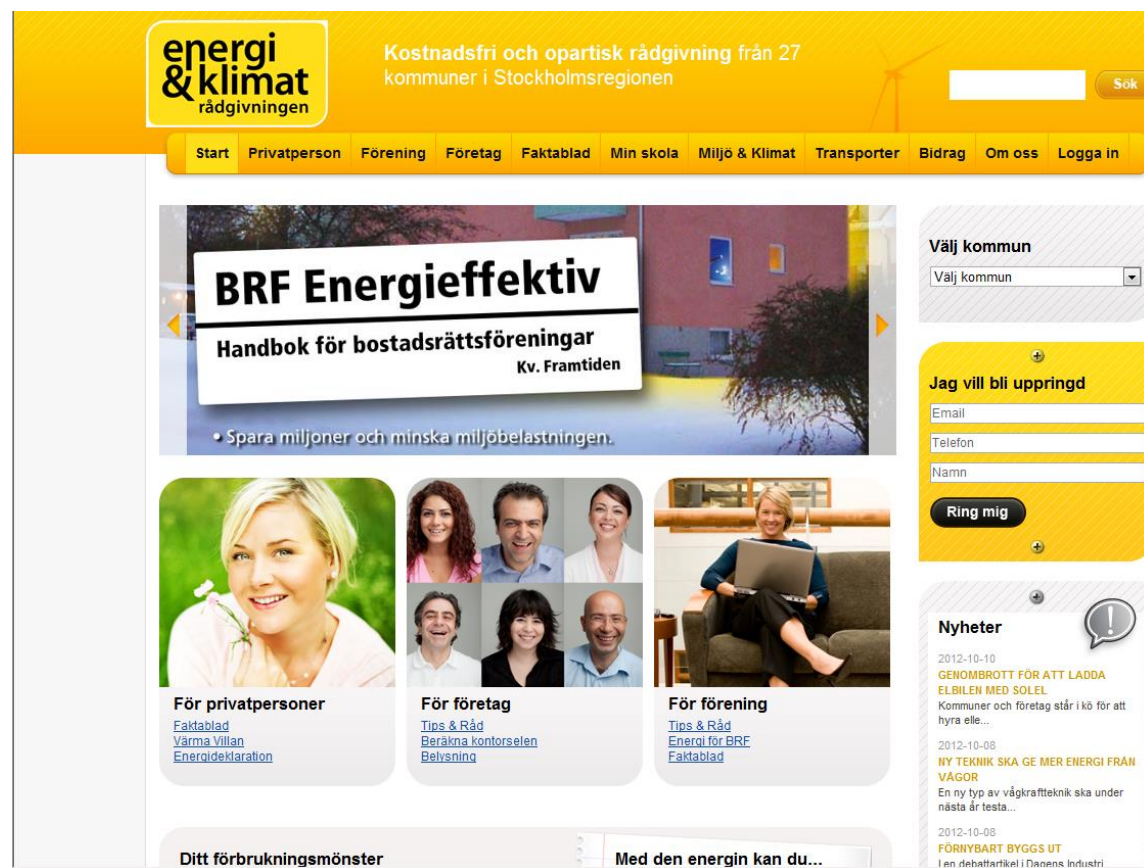
GrowSmarter: -60 %



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# Energy and climate advice service

- Telephone advice service
- On site advice. Priority Condominiums.
- Information on website



The screenshot shows the homepage of the 'energi & klimat rådgivningen' website. The header is orange with the logo on the left and the text 'Kostnadsfri och opartisk rådgivning från 27 kommuner i Stockholmsregionen' on the right. Below the header is a navigation bar with links: Start, Privatperson, Förening, Företag, Faktablad, Min skola, Miljö & Klimat, Transporter, Bidrag, Om oss, and Logga in. The main content area features a large banner for 'BRF Energieffektiv Handbok för bostadsrättsföreningar Kv. Framtiden' with a sub-headline 'Spara miljoner och minska miljöbelastningen.' Below the banner are three columns of content: 'För privatpersoner' with links to Faktablad, Värma Villan, and Energideklaration; 'För företag' with links to Tips & Råd, Beräkna kontorselen, and Belysning; and 'För förening' with links to Tips & Råd, Energi för BRF, and Faktablad. On the right side, there is a 'Välj kommun' dropdown menu, a 'Jag vill bli uppringd' form with fields for Email, Telefon, and Namn, and a 'Ring mig' button. At the bottom right, there is a 'Nyheter' section with a list of recent news items, including 'GENOMBROTET FÖR ATT LADDA ELBILEN MED SOLEL' and 'NY TEKNIK SKA GE MER ENERGI FRÅN VÄGOR'.



# Cooperation with private real-estate organisation

- Energy efficiency and renewables
  - Common demonstration projects
  - City-Private sector know-how exchange
  - Knowledge dissemination to property owners
- 
- LOI March 2013

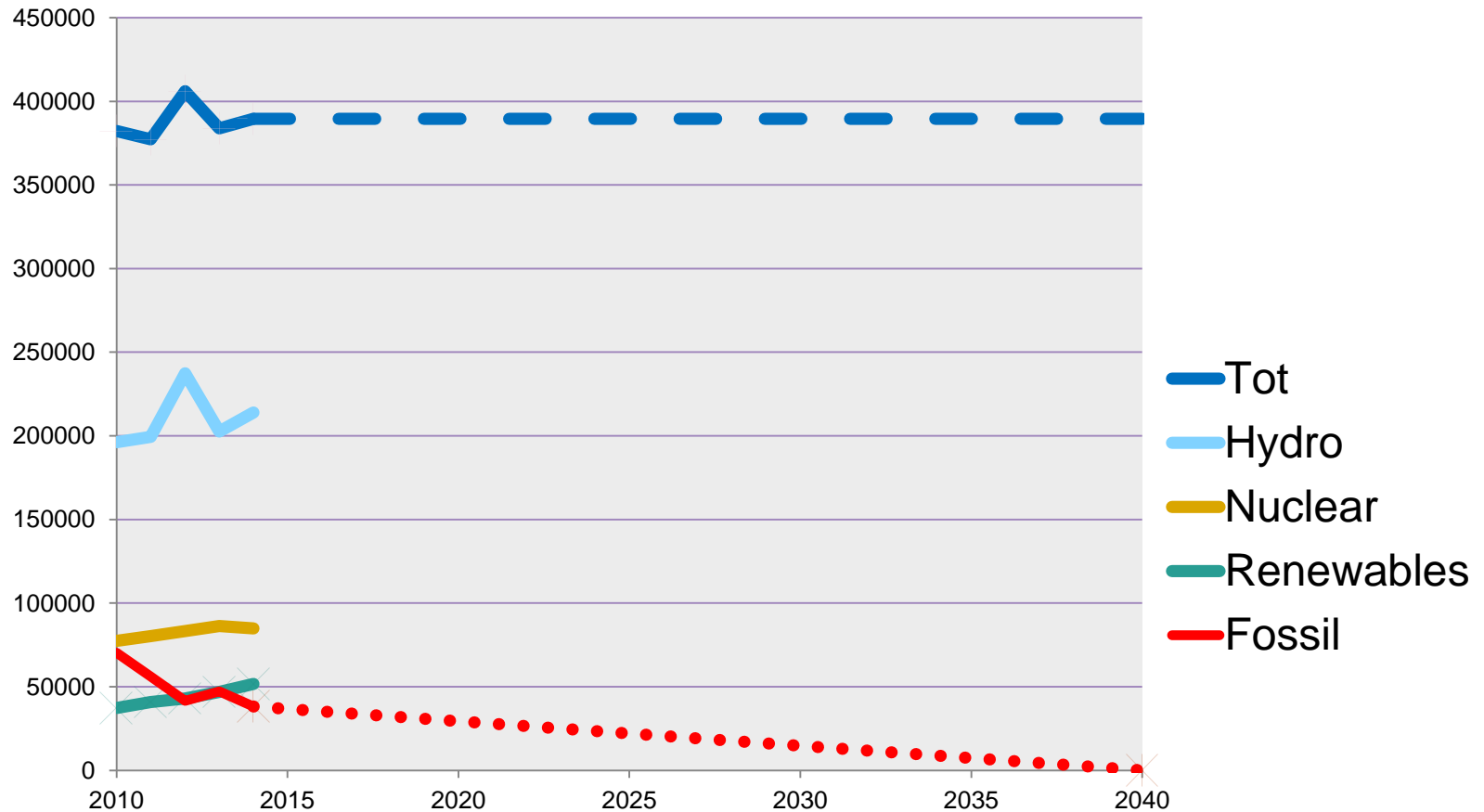


# Electricity





# Fossil free electricity (Nordic mix)



# Electricity and gas – measures to 2020



Increased energy production from photovoltaics

- 10% of municipal use by 2040

Increased biogas production from collected food waste (20.000 tonnes)

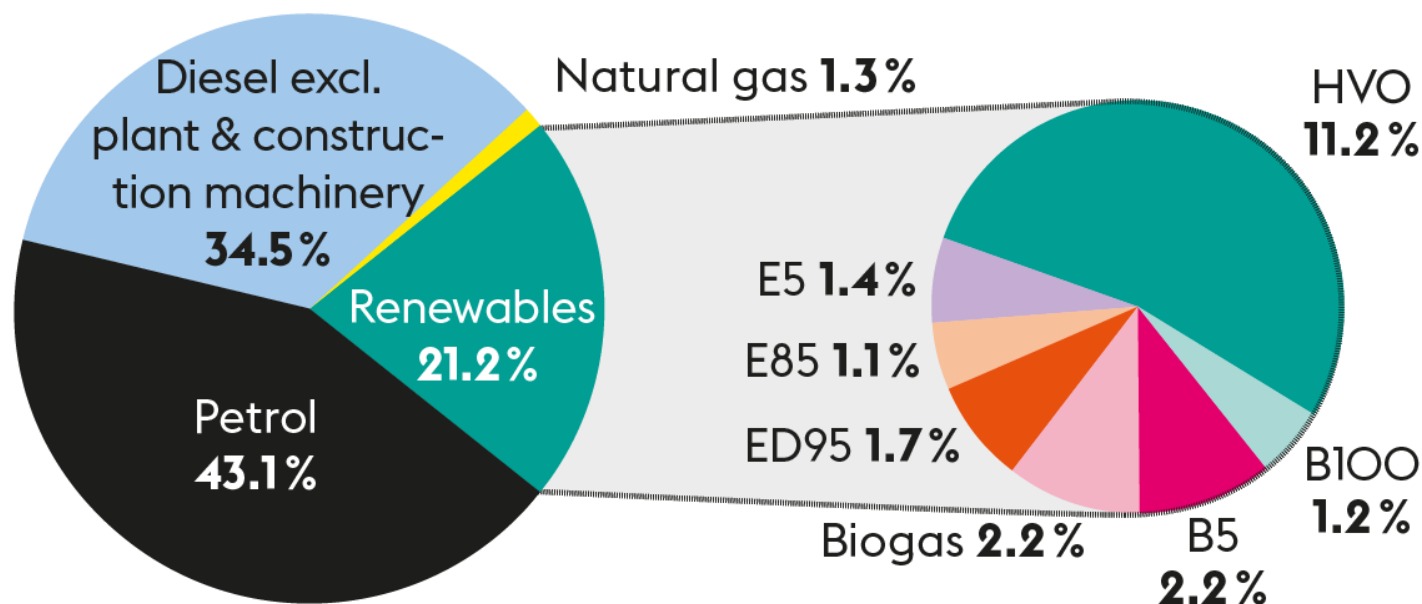
- 70% collected by 2020



# Reducing emissions from transport



## Fuel for road traffic in Stockholm County

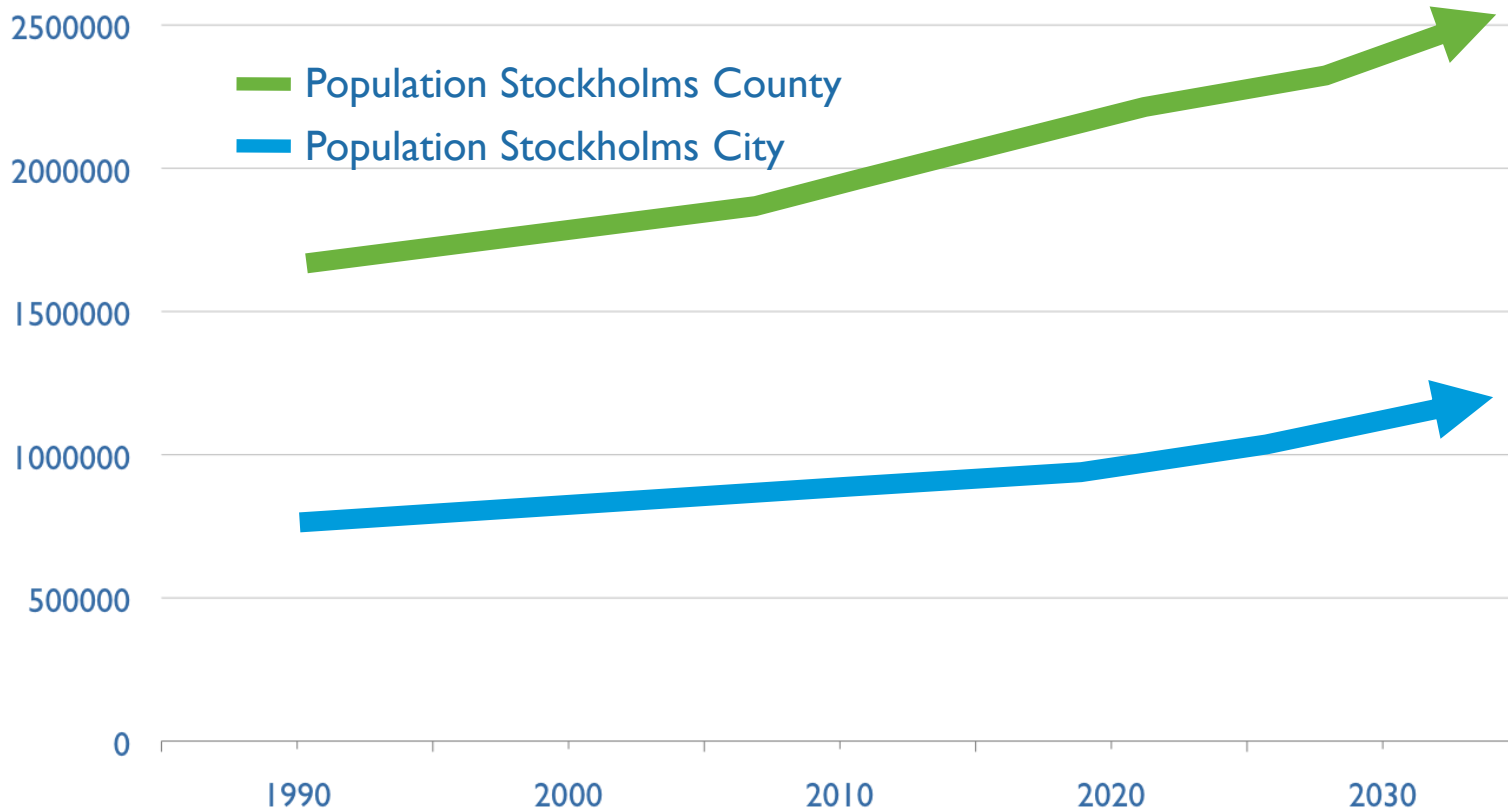


In 2014 road traffic used fuel equivalent to 3,100 GWh. Renewables accounted for 21 percent (650 GWh) of this total.

Source: Environment and Health Administration

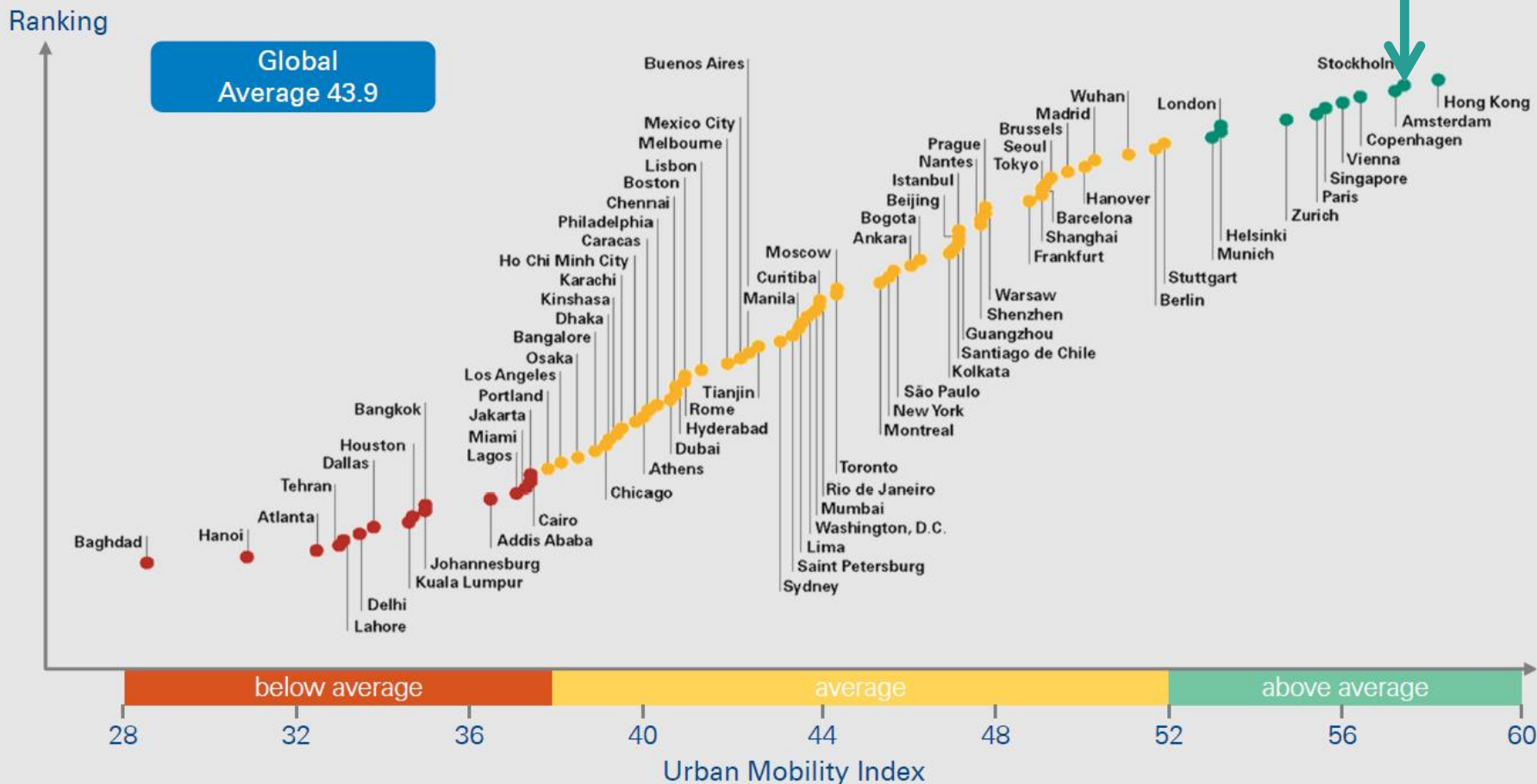


# Stockholm grows more rapidly than ever



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# Urban Mobility Index 2.0



Source: Arthur D. Little Urban Mobility Index 2.0; UITP is independent of this index, which does not necessarily reflect its opinion<sup>†</sup>; 100 index points for city that would achieve best performance on each criteria.



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# Transport – measures to 2020

## Transport efficient city planning

- Urban planning
- Mobility strategy
- Parking fees, congestion charge
- Biking measures
- Promotion of public transport

## Energy efficient vehicles

- EU Directives

## Renewable fuels

- Charging stations
- Biogas for transport
- Transport procurements



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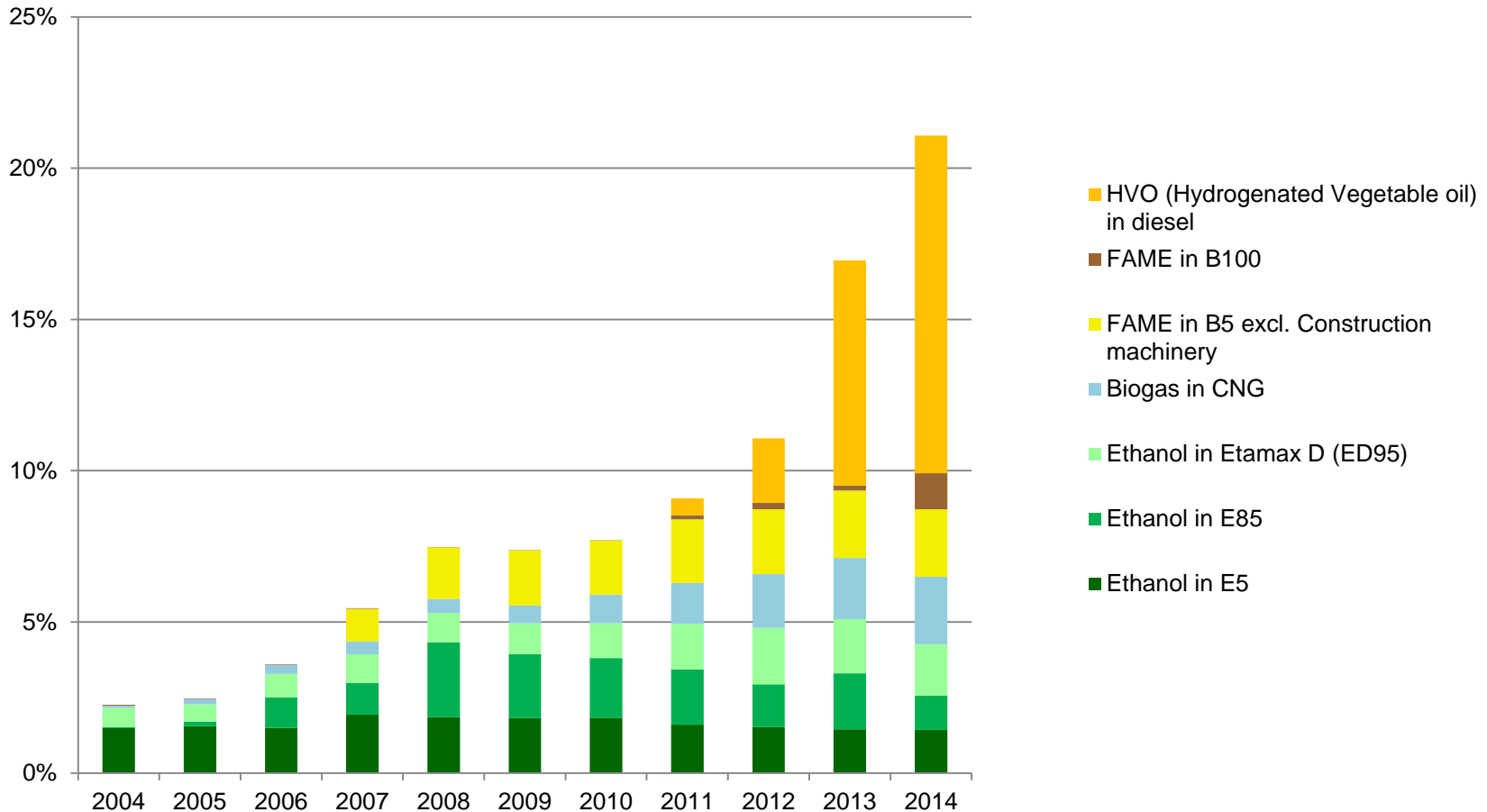
# New infrastructure for public transport – and dwellings





# Renewable fuels for road transport

Stockholm 2004 – 2014 (But still approx 80 % fossil)



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# Transport – measures to 2020

## Transport efficient city planning (-80.000 tonnes)

- Urban planning
- Mobility strategy
- Parking fees, congestion charge
- Biking measures

## Energy efficient vehicles

- EU Directives

## Renewable fuels (-140.000 tonnes)

- Charging stations
- Biogas for transport
- Transport procurements



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# Transport: strategic work for 2040

- Strategic plan for fossil free transport sector and investigate prohibiting fossil fuels for vehicles
- Introduce environmental zones in the city for private cars and vans prohibiting fossil fuels by 2040
- Work to get better legislation empowering the city for fossil free transport
- Investigate measures for fossil free shipping
- Investigate measures to get construction machinery fossil fuel free



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# Climate compensation for possible remaining emissions: Biochar as one possibility

Green  
waste



Soil  
improvement

Heating

Construction  
material

Carbon sink



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# 1990: Swedish CO<sub>2</sub>-tax

## Energy tax:

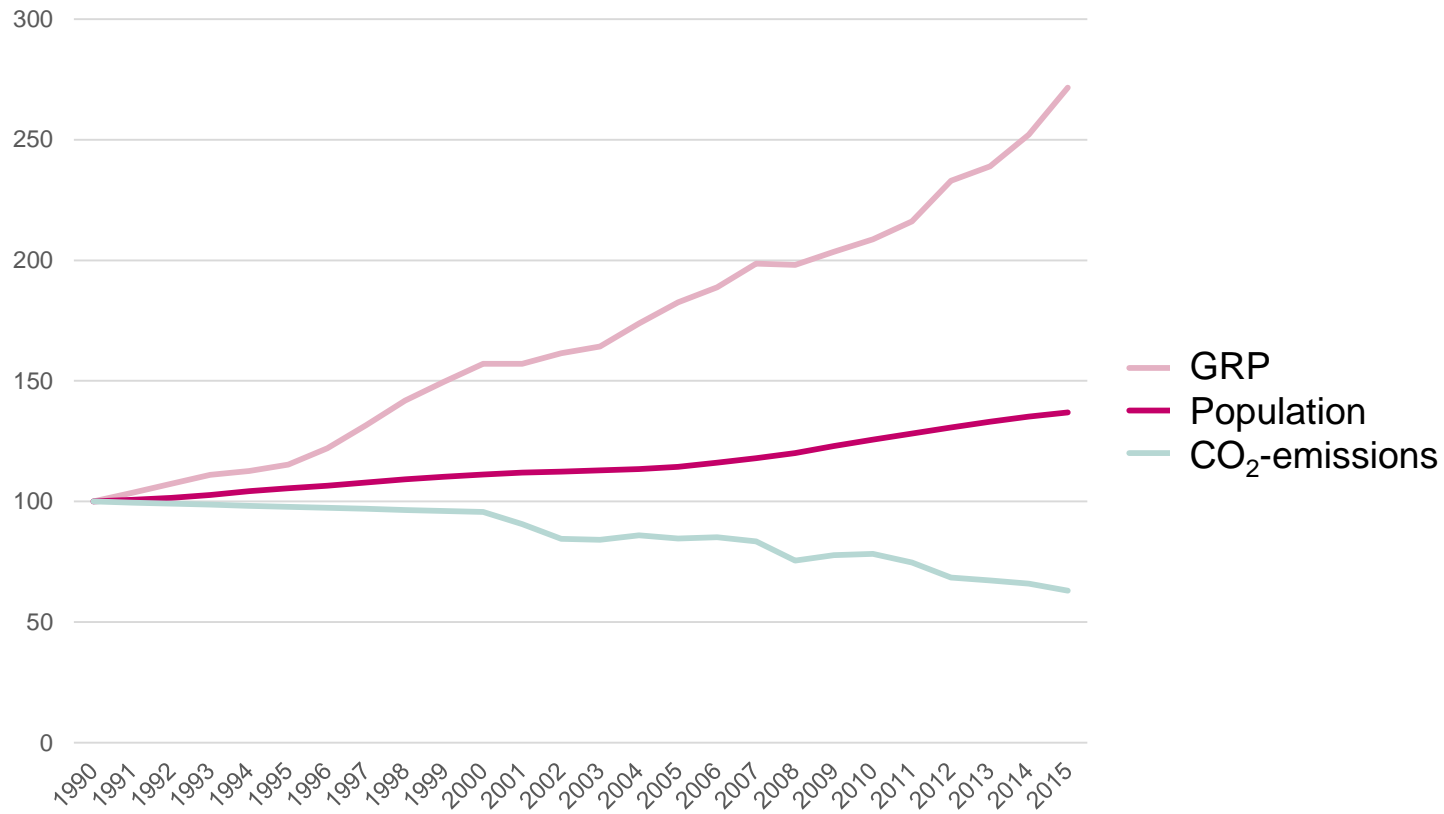
- Introduced in: 1924 petrol ; 1951 electricity ; 1957 oils and coal ; 1964 LPG ; 1985 natural gas.
- Strictly based on energy content of fossil heating fuels from 2011. Moving towards a uniform energy content application for motor fuels.

## 1990/1991 tax reform

- Reduced tax on labour
- Increased taxes on energy:
- VAT on energy
- CO<sub>2</sub> tax
- Investment state aid for fossil free energy production



# Emissions and growth are decoupled





# THE GROWSMARTER PROJECT 2015-19

Creating a Market for 12 Smart Solutions





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