Göteborgs Stad

Smart city Gothenburg

Sustainable and innovative urban development

All Energy Conference Glasgow 2015

Anna Svenson, City Planning authority, City of Gothenburg

Why

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"In 2050 Gothenburg has a sustainable and equitable level of greenhouse gas emissions"

- The city expands
- Tools to work with energy in urban planning
- Involve more actors in energy/urban planning
- Try new ideas and new ways to cooperate
- Show room for the city
- Reach local climate objectives

SEAP – consumption perspective

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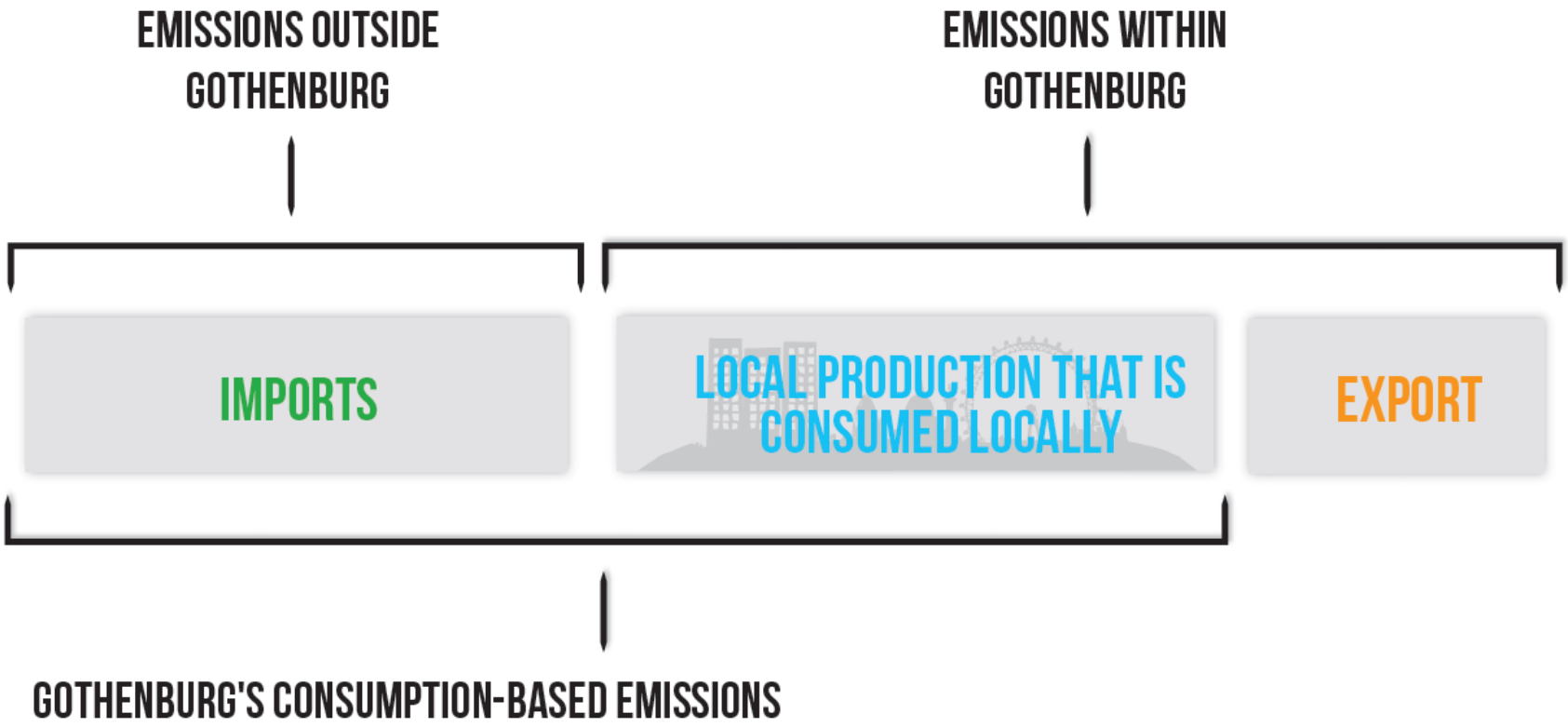

SEAP - results

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- Emission objectives for 2020, 2035 and 2050
- 9 strategic objectives
- 24 strategies
- Primarily the City of Gothenburg
- Include industry and inhabitants

Enhanced SEAP

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- More resources to stakeholder involvement and development
- Updated energy balance
- More defined objectives
- Prioritising of actions
- Helpful to implementation phase

Lessons learned…

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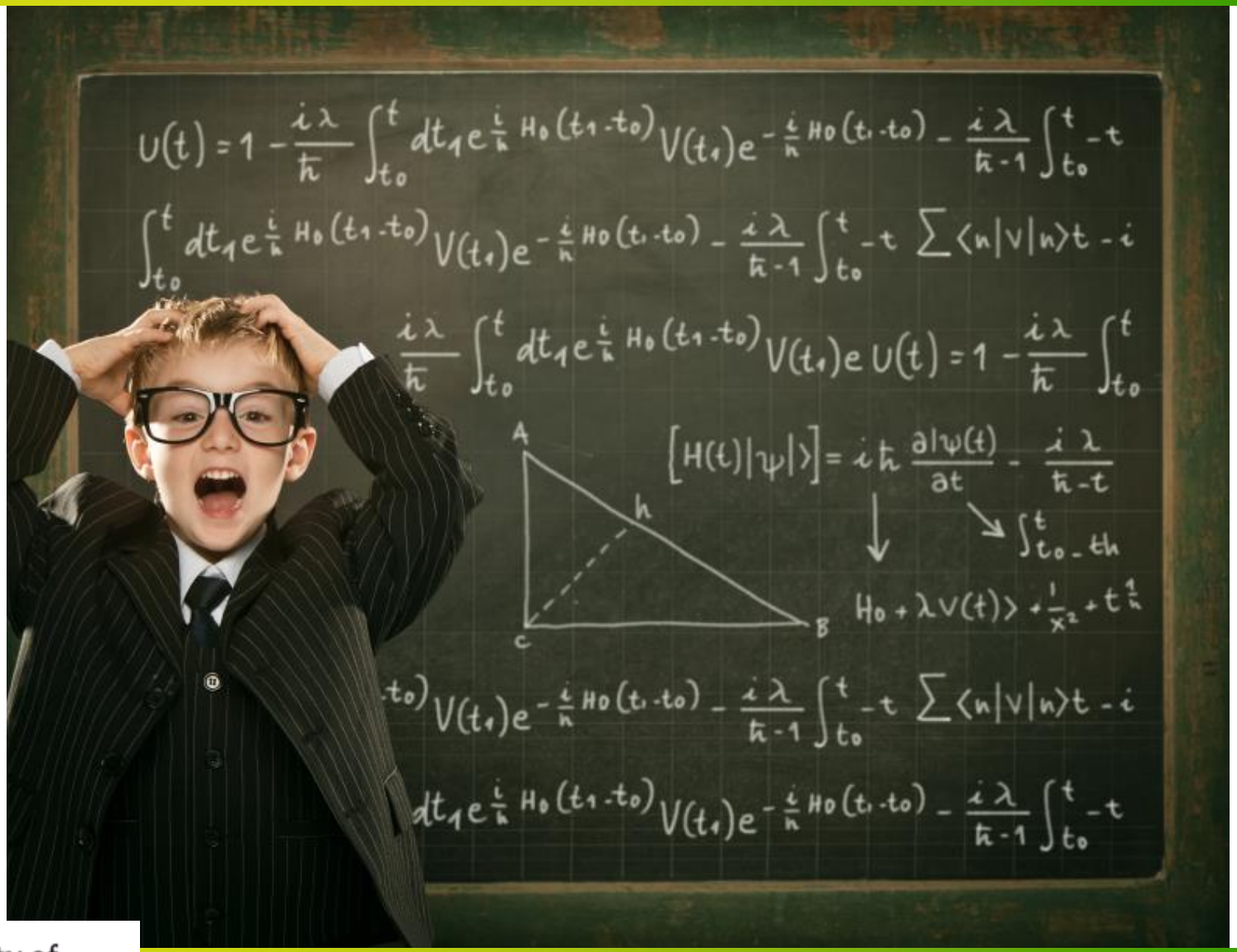

SEAP - Learning points

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- Valuable to involve many stakeholders – takes time though
- Can be a challenge to commit right people
- Challenge to find right level for objectives and strategies
- Important with well prepared project management
- Anchoring among stakeholders both during development and implementation
- Well aware politicians
- SEAP template isn't as flexible as one could want
- Nicely packaged

Key Findings – Step Up project

www.stepupsmartcities.eu

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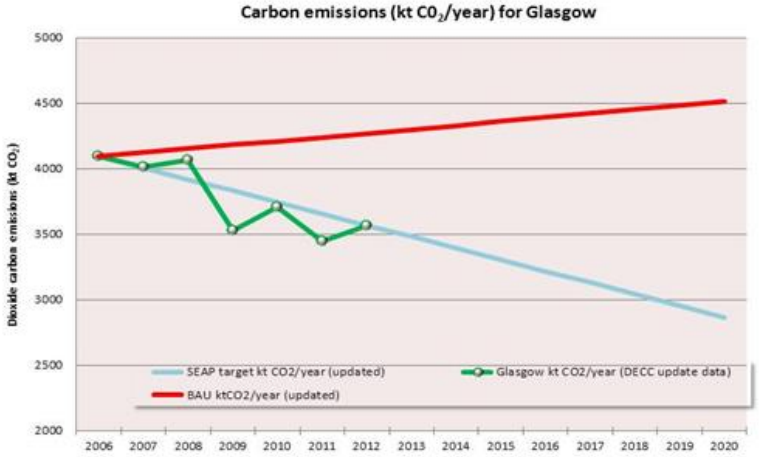
- Energy is not a significant issue in urban planning
- Stakeholder engagement
- Cooperation takes time



- SEAP process is demanding and requires sufficient resource.
- To many strategies – how to handle conflicts?

City of Gothenburg

Key Findings – Step UP project

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- Integrated projects – integrated responsibility
- Reasonable business models
- Collaboration cross sector
- Share experience
- Increased our collaboration and understand each other better

- Input to several other applications.
- Increased focus on innovation and developing projects.

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Experiences

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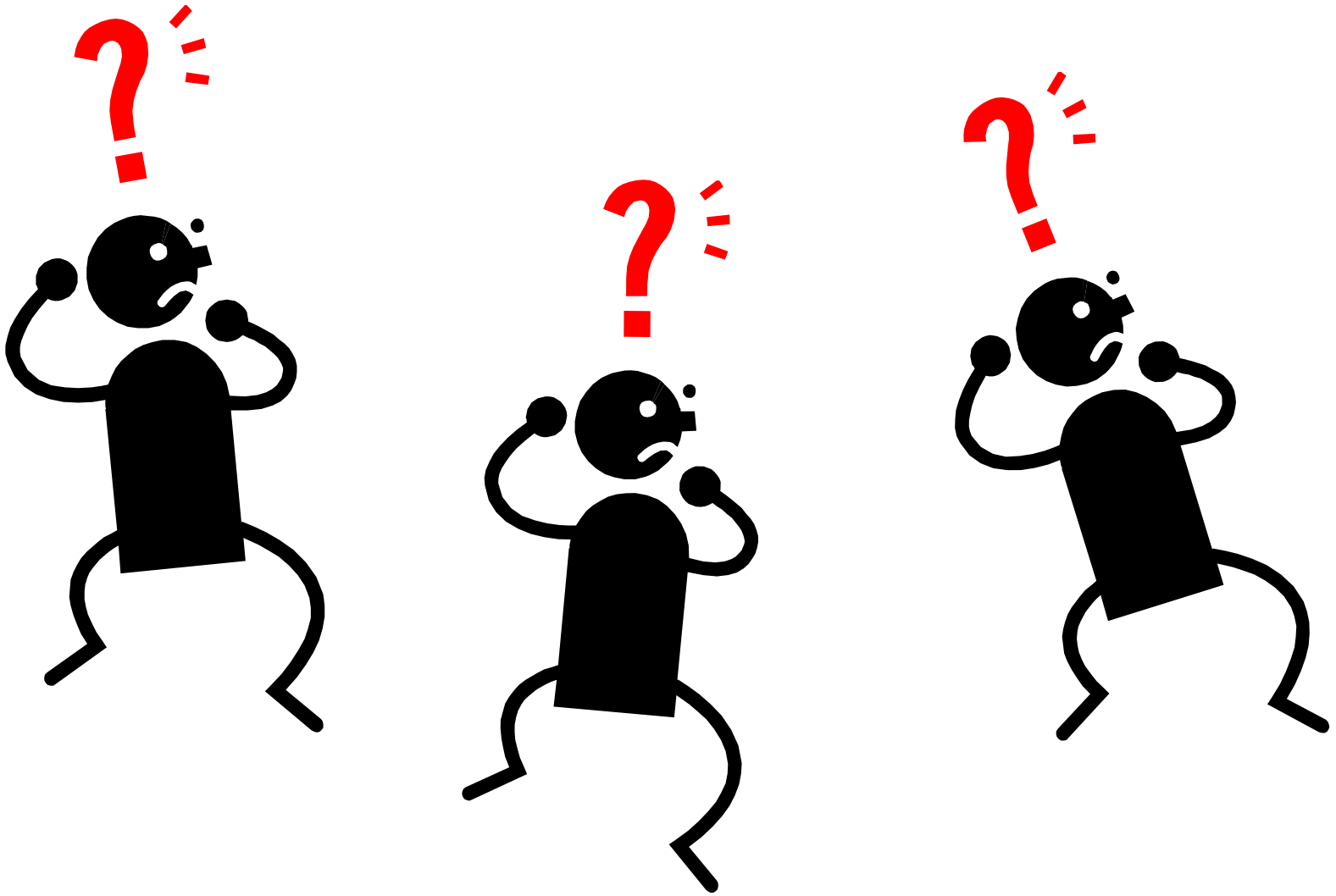

One thing to remember!

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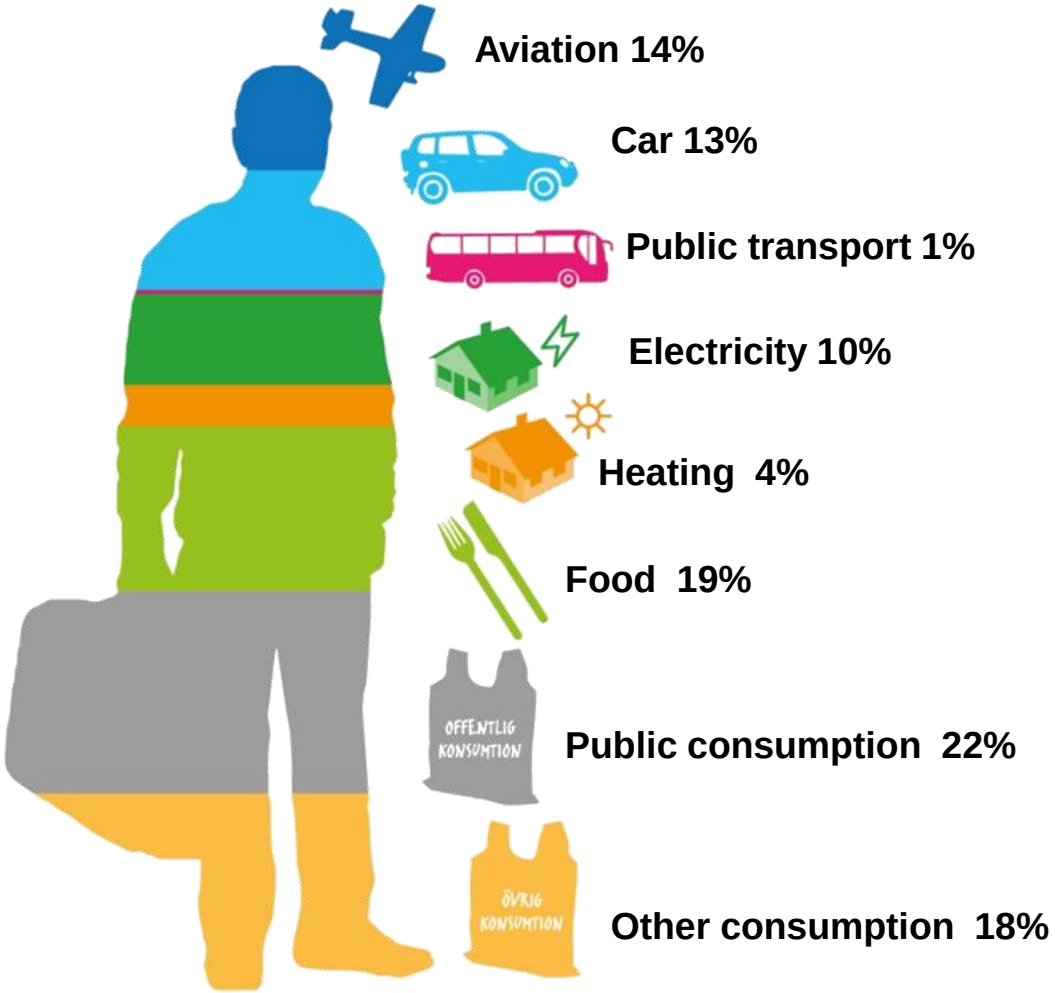


Aviation 14%

Car 13%

Public transport 1%

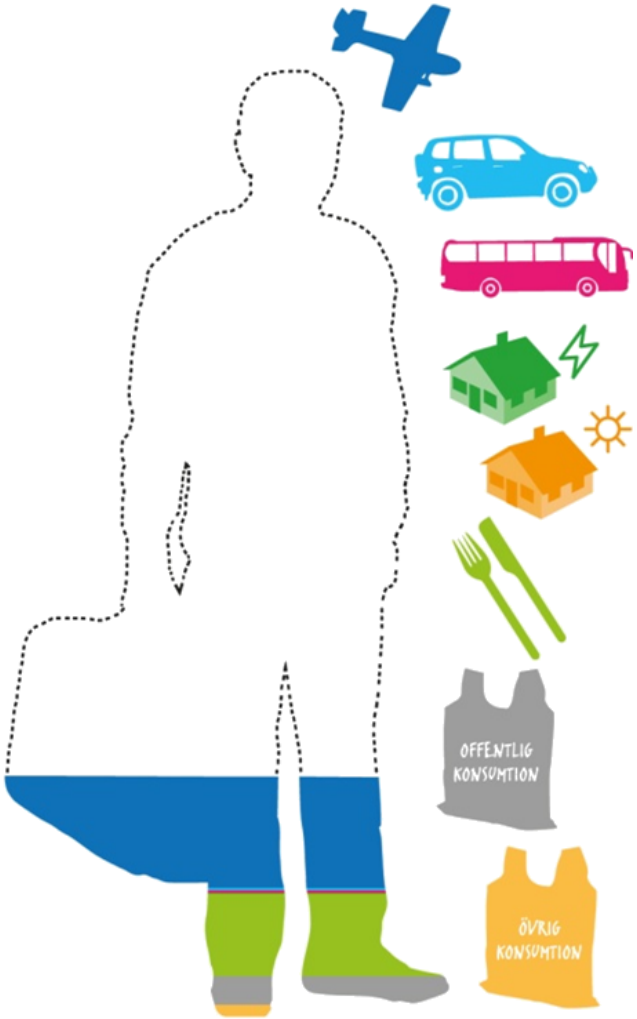
Electricity 10%

Heating 4%

Food 19%

Public consumption 22%

Other consumption 18%



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Thank You

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9 strategic objectives

1. In 2030 all **district heating** is produced from renewable energy sources, waste incineration or industrial excess heat.
2. By 2030 the total **use of primary energy** sources for electricity and heat does not exceed 31 MWh per inhabitant.
3. In 2030 the City of Gothenburg produces at least 500 GWh **renewable electricity** and 1200 GWh of **biogas**.
4. Carbon dioxide emissions from **road transport** in the geographical area of Gothenburg will decrease by at least 80 percent by 2030 compared to 2010.
5. By 2030 carbon dioxide emissions from **shipping** in the geographical area of Gothenburg will decrease by at least 20 percent compared to 2010.
6. Climate impact from citizen's **air travel** will be reduced by at least 20 percent by 2030 compared with 2012.
7. By 2030 the climate impact of **food** consumed in the City of Gothenburg will be reduced by 40 percent compared to 2010.
8. The climate impact from our purchases of **materials** should decrease. A target for 2030 will be set before 2018.
9. By 2030 the amount of **household waste** per capita in Gothenburg will be reduced by 30 percent compared to 2010.

Enhanced SEAP

- More robust
- More flexible to local and global changes
- Possible for more stakeholders to involve in future actions
- Strategies have been chosen through stakeholder involvement
- Strategies are combined through our challenges and objectives

STEP UP
City of Gothenburg
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SEAP Follow-up

- **Access to data for:**
  - district heat production, production of renewable electricity and biogas
  - energy consumption
  - emission from road transport and shipping
  - household waste
- **More challenging follow up:**
  - aviation
  - food (public and private)
  - purchase of material and goods
  - public consumption
  - other consumption

Analysing Energy Flows

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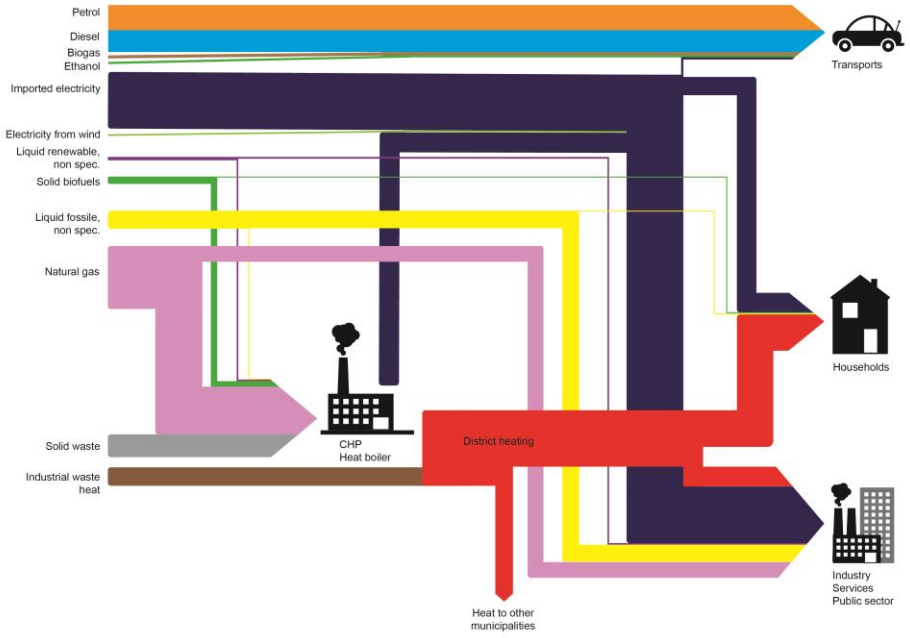
- Energy consumption analysed by sector
- Identification of main energy consumers
- Outline of energy infrastructure, production and distribution
- Projected energy flows under BAU and 2 other scenarios

Analysing Energy Flows



- Analysis of efficiency of energy use
- Real energy supply and consumption flows
- Sources, fuels, sectors

SEAP

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- All 4 cities delivering enhanced SEAPs that demonstrate:
  - integrated ‘STEP UP ‘ approach
  - Targeted and implementable actions
  - Stakeholder involvement
  - Supported politically and by stakeholders

- **Ghent** – Climate Plan 2014-2019
- **Glasgow** – Energy and Carbon Masterplan 2014-2020
- **Riga** – Smart City – Sustainable Energy Action Plan 2014-2020
- **Gothenburg** – Climate Strategy Programme for Gothenburg

- Consumption perspective in Climate Strategy Programme for Gothenburg

Project one Smart Urban Logistics

– development of local, small scale infrastructure to enable upcycling, reuse and material recycling in a new district.

Micro terminal concept with electric cars and bicycles and reuse-galleria

- Using an innovation process originally designed for entrepreneurial/business development on urban development. We have a challenge and the solution is created through an inclusive method by the stakeholders. The city does not has all the answers!
- Logistics is a strategic area for the City of Gothenburg. History of trade and logistic with the largets Port in Scandinavia. Previous car-centered city planning is now replaced-. Studies and evalutaion of the best practice project show development potential and successful results on urban environment.
- The labs are a key element, the solution being designed is less technical and more behavioral based now in lab 5 compared with when we started.
- Development of project on sustainable urban transport

To many strategies?

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A model..

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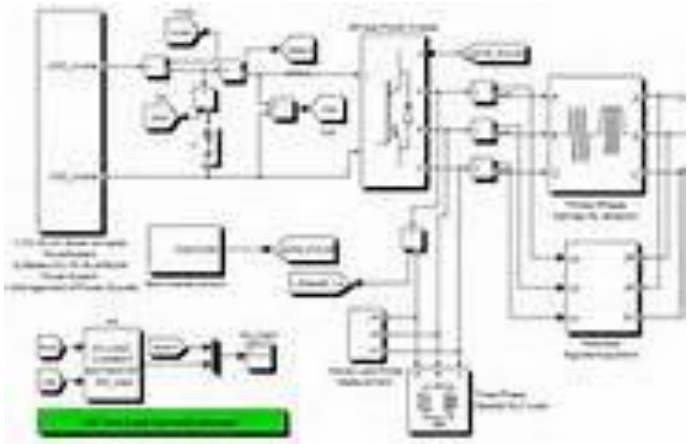

$$y_{\cdot} = \int (y\,dA)/A = y_o(Q_{\cdot}) + \frac{1}{2!}\Sigma\,(\delta^2 y/\delta Q^2)_{\cdot}\int (q^2\,dA)/A + \frac{1}{3!}\Sigma\,(\delta^3 y/\delta Q^3)_{\cdot}\int (q^3\,dA)/A + \ldots$$

or a model…

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Energy matrix

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