

Workshop in Zagreb, 5 April 2011
Sustainable Energy Action Plans in Croatia

**Developing & Submitting Successful SEAPs
– experience from Denmark and the IEE
Come2CoM project**

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Content

- Introduction to the Covenant of Mayors/CoM and the IEE COME2COM project that support CoM development
- Danish Experience
 - Baseline Emission Inventory
 - SEAP implementation (incl. two case examples)
 - State of COME2COM activities in DK
- Conclusion

Covenant of Mayors

- A European initiative for mobilising cities for energy and climate action

- ▶ The Covenant of Mayors is a **formal commitment** to **go beyond the EU 2020 objectives** in terms of reducing CO₂ emissions.
- ▶ The EU Energy for a Changing World package, adopted in 2007, commits the EU to reduce CO₂ emissions by 20% by 2020, as a result of:
 - ▶ a 20% increase in energy efficiency, and
 - ▶ a 20% share of renewable energy in the supply mix .

To be achieved
before 2020

What is expected from a CoM city

- ▶ Signing the Covenant commits the signatory to :
 - ▶ Prepare a baseline emissions inventory
 - ▶ Submit a Sustainable Energy Action Plan (SEAP)
 - ▶ Submit an implementation report every 2 years after that
 - ▶ Attend the annual Covenant of Mayors conference
 - ▶ Share experience with other areas
 - ▶ Promote the Covenant

2.373 CITIES SIGNED UP

and commit to reduce CO₂ emissions on their territories

by at least **20%** by **2020!**

Incl. 17 cities in Croatia

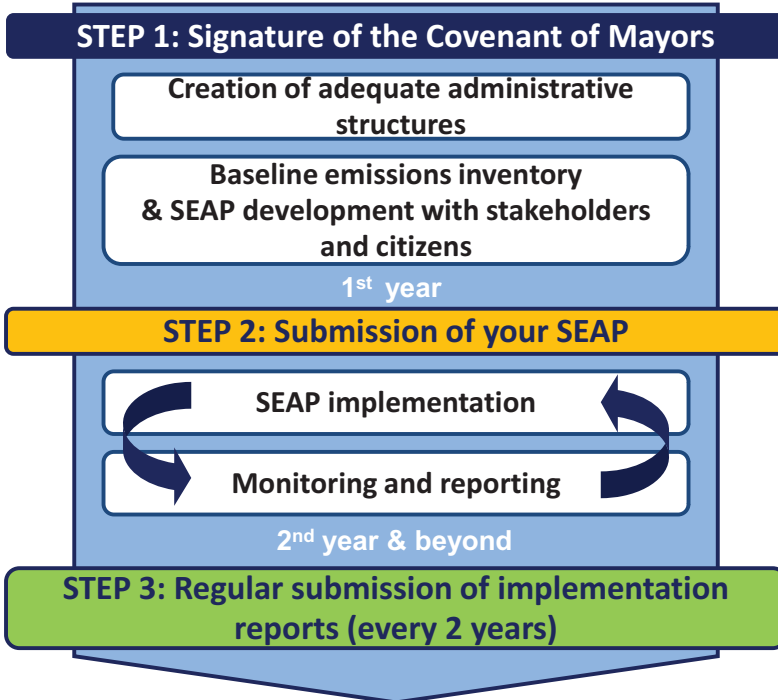


2020

-20% CO₂



CoM – the essential steps



2020

-20% CO₂

SEAP development with stakeholders

What to plan for each sector?

- ▶ **Targets** : Energy saving target, Energy production target, CO2 reduction target
- ▶ **Key actions / measures, with:**
 - ▶ **Responsible department /person / company**
 - ▶ **Implementation timing** (start & end time)
 - ▶ **Estimated costs** per action / measure
 - ▶ Expected **energy saving** per action/measure + target per sector
 - ▶ Expected **energy production** per action/measure + target per sector
 - ▶ Expected **CO2 reduction** per action/measure + target per sector



Supporting structures

- ▶ **Type 1: Public authorities**, such as national or regional authorities, provinces, counties.
- ▶ **Type 2: Associations of local or regional authorities** (this type can be a supporting structure even if does not offer financial support)



Get on board the Covenant
and fight climate change !

What is the come2CoM project?

- ▶ A 2 year project running from 1 May 2010 to promote and support the Covenant of Mayors initiative
- ▶ Delivered by a European partnership of 12 sustainable energy specialists in 11 countries:

Austria	Belgium	Czech	Denmark
Germany	Italy	Poland	Portugal
Slovenia	Sweden	UK	
- ▶ Supported by the Intelligent Energy Europe programme

Services of the come2CoM project

- ▶ Advise on joining process and help overcome barriers
- ▶ Provide expertise and support to:
 - ▶ prepare the Baseline Emission Inventory
 - ▶ prepare the Sustainable Energy Action Plan (SEAP)
 - ▶ set up systems to monitor and evaluate progress
- ▶ Help to develop the action plan to implement the SEAP
- ▶ Facilitate engagement of stakeholders at all stages
- ▶ Facilitate cross - sectoral co-operation & mutual support between members
- ▶ Provide Good Practice examples

Current state of the come2CoM project

- ▶ The project partners are active on acquisition of cities and assisting on SEAP development in the target countries/regions

A total of around 3,000 cities are to be approached and 70 of those be given direct assistance in SEAP development

- ▶ This is accompanied with an evaluation of the CoM methodology used as well as the drivers and barriers for CoM SEAP development in each country/region
- ▶ Another activity is to extract Good Practices and undertaking dissemination; e.g. a CoM video is under development
- ▶ The findings so far will be discussed at project meeting in Prague, 7-8 April, including a plan for the further evaluation and communication of the project

2020

-20% CO₂



Further assistance & info

The Covenant of Mayors Office

info@eumayors.eu

www.eumayors.eu



GUIDEBOOK - DEVELOP A SUSTAINABLE ENERGY
ACTION PLAN/SEAP

ENTRANCE SITE TO COME2COM

www.swea.co.uk/proj_Come2CoM.shtml

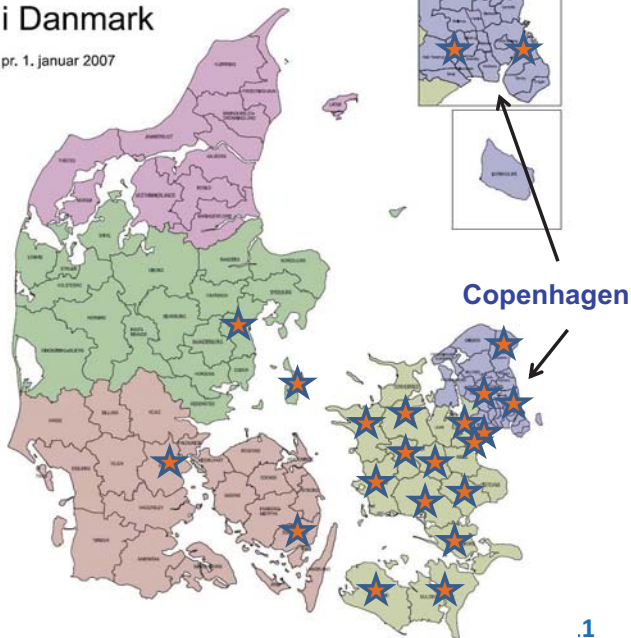


'Diagnosis' of SEAP development in Denmark

More than half of the around 100 Danish municipalities are active on SEAP development in some form. However, in many cases the SEAP is limited to the municipal sector and there is hesitation towards CoM

De nye regioner og kommuner i Danmark

pr. 1. januar 2007



The CoM development is concentrated in Region Zealand and the Copenhagen area. Pioneer municipalities were the driving force in joint membership with the regional authority as Supporting Structure

Methodology on SEAP development in Region Zealand

Developed by University of Roskilde/RUC
on behalf of Region Zealand
(serving Supporting Structure)



The methodological steps

1. **Baseline Emission Inventory:** Assessment of CO₂ emissions in the reference year
2. **Scenario:** Business As Usual/BAU development of emissions in the SEAP period
3. **Key actions:** Pinpointing appropriate key actions
4. **SEAP implementation:** Specific actions within the SEAP framework

The methodological principles

- ***System oriented and integrated approach:*** Analyse the entire energy system in conjunction with related systems
- ***Consistency in choice of method:*** Where one essential intention is to avoid double counting
- ***Action oriented and operational:*** Relating the emissions to the actual context and emission factors. This is to enable the SEAP to confront the complexity of the 'real world'
- ***Precision in the calculations:*** The ambition is to make the CO₂ assessment as specific and accurate as possible. However, it is to be weighed and prioritised against the available resources and the given sector's significance in the total account
- ***The challenge:*** Data availability (and quality of given data)!

Baseline Emission Inventory

IPCC's basic formula:

$$\text{Emissions} = \text{Activity data} * \text{Emission factor}$$

Where:

Activity data: Data for the amount of an activity.

Emission factor: Numbers for emissions per activity unit

IPCC sektors:

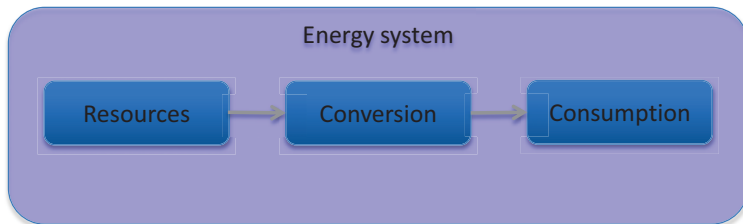
- Energy
- IPPU (industrial gases)
- AFOLU (agriculture, forestry og area)
- Waste

Our sektors (sub sektors):

- Elektriciteit
- Heat
- Transport
- Industry
- Agriculture
- Waste
- LULUCF (area)

Mapping of the entire energy system:

- Relate activity to emissions
 - Identify losses in the system
- = More accurate and helping to point out appropriate scope of actions



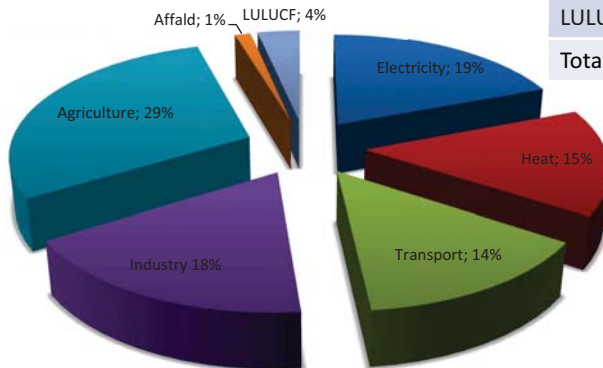
Key facts about Lolland

Total emissions: 900.475,3 ton CO₂-eq
 All district heating based on bioenergy and no natural gas

Key figures:

- 260 kWh/m² for heating
- 177 g. CO₂-eq/kWh (heating)
- 141 g. CO₂-eq/pkm
- 7,8 MWh/inhabitant
- 18,67 ton CO₂-eq/inhabitant

Sector	Emissions (ton CO ₂ -eq)
Electricity	172.407,2
Heat	136.303,6
Transport	127.469,3
Industry	159.414,8
Agriculture	263.599,0
Waste	11.245,1
LULUCF	30.036,3
Total	900.475,3



Lolland is a typical agricultural municipality, with high share of oil consumption

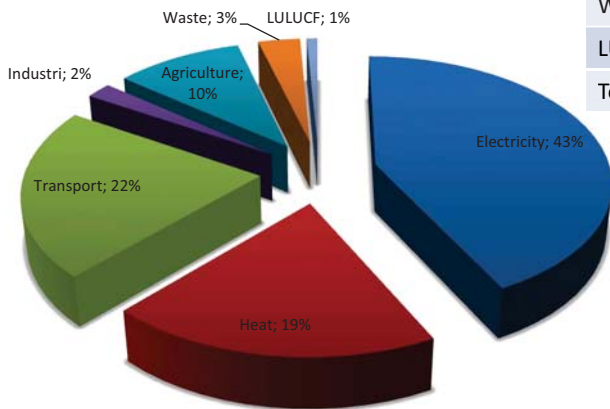
BEI City of Roskilde

Brief about Roskilde

Total emissions: 835.982 ton CO₂-eq

Selected key figures:

- 144 kWh/m² for heating
- 176 G. CO₂-eq/kWh (heating)
- 128 g. CO₂-eq/pkm
- 9,6 MWh/inhabitant
- 10,3 ton CO₂-eq/inhabitant



Sector	Emissions (ton CO ₂ -eq)
Elektricitet	355.819,0
Heat	162.932,5
Transport	180.912,3
Industry	16.986,0
Agriculture	84.373,9
Waste	27.852,5
LULUCF	7.105,64
Total	835.982,0

The BEI of Roskilde calls for attention of the relative high electricity consumption

City of Kalundborg

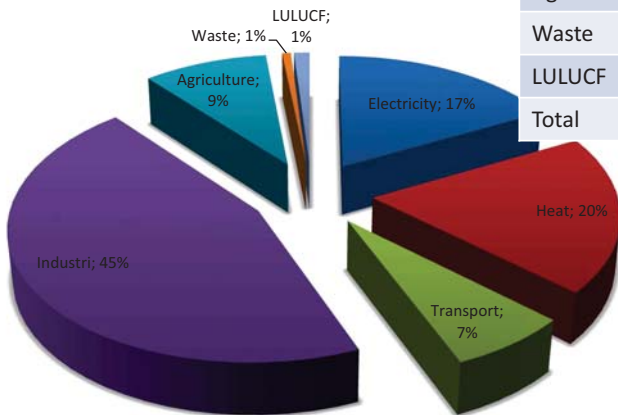
Brief about Kalundborg

Total emissions: 1.743.742 ton CO₂-eq

Selected key figures:

- 171 kWh/m² for heating
- 130 g. CO₂-eq/pkm
- 13 MWh/inhabitant
- 28,8 ton CO₂-eq/inhabitant

Sector	Emissions (ton CO ₂ -eq)
Electricity	302.164,4
Heat	337.940,5
Transport	122.526,4
Industry	786.305,8
Agriculture	162.999,3
Waste	11.474,3
LULUCF	20.331,2
Total	1.743.742,0

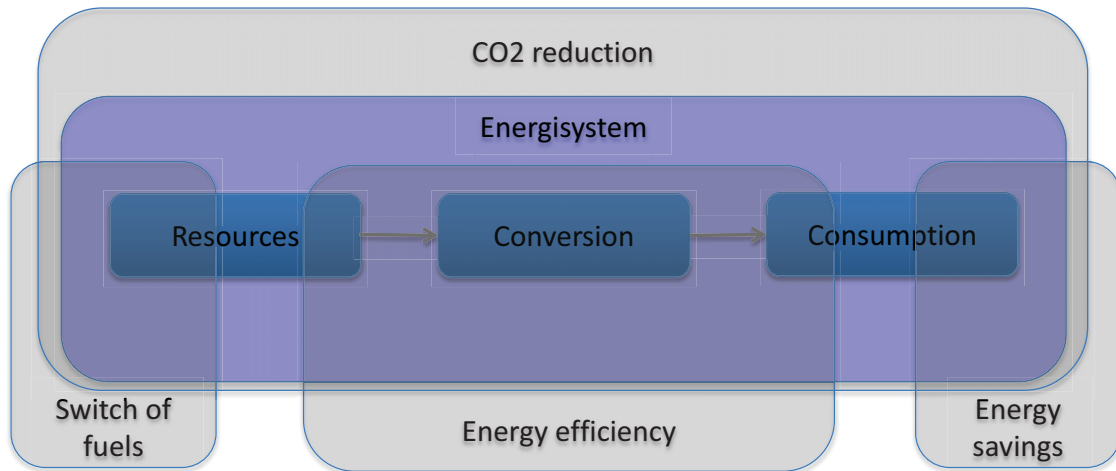


Kalundborg is characterised by concentration of heavy industry. The municipality has developed interesting concepts for meeting this challenge like industrial symbiosys

Planning of SEAP implementation

1. There is to be a significant potential
2. The municipality is to have scope of maneuver for action in the given field
3. It is to be technically and economically feasible
4. There is to be ensured local support
5. The effort is to be seen in relation to the entire energy system

Planning of SEAP implementation



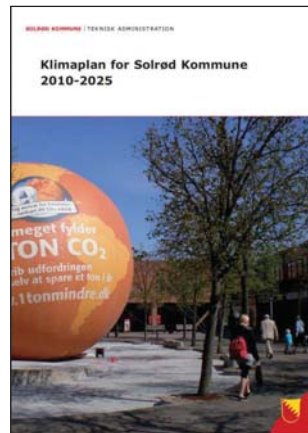
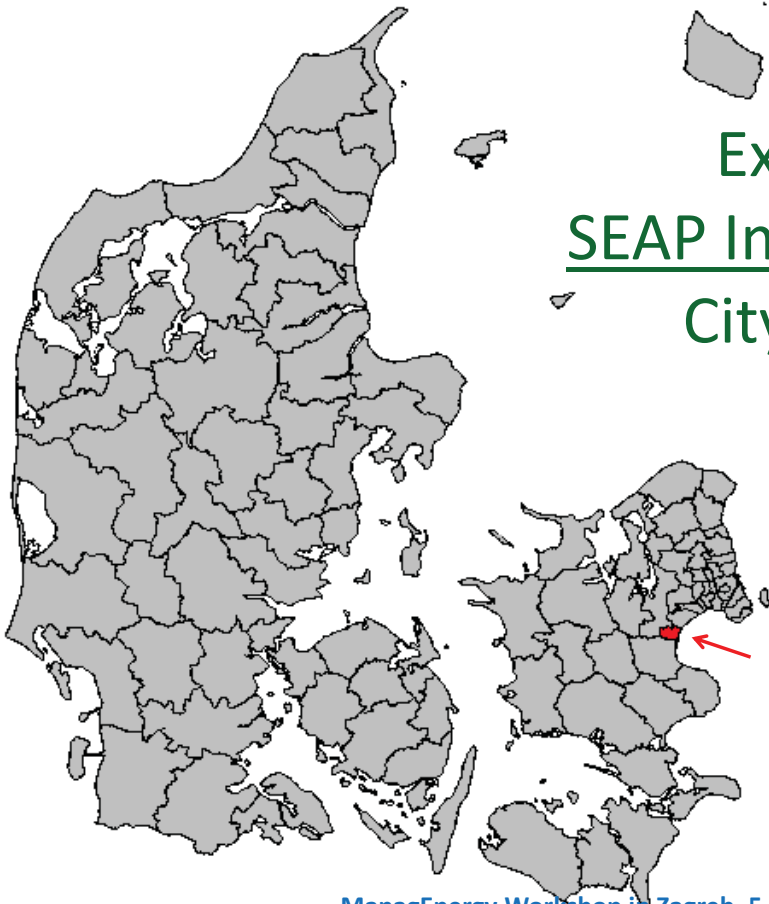
Via the system approach:

- You avoid sub optimisation
- Reveal the hidden potentials
- Make it more likely that the estimated effects will actually happen

Focus of the SEAP

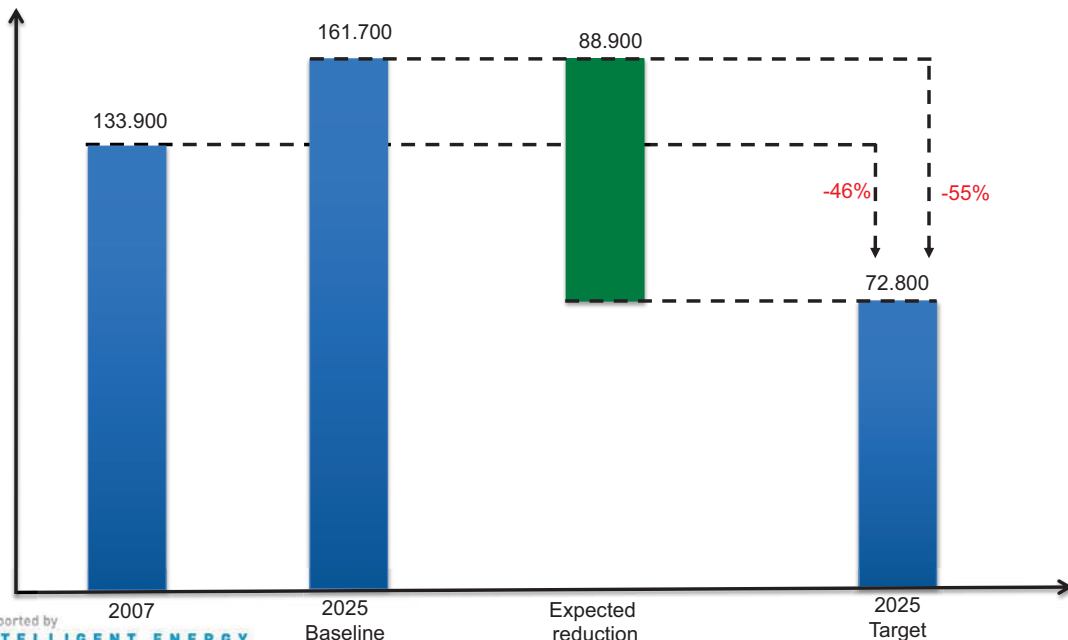
- Focus on how the municipality can act locally
 - Operational: Scope of action in the municipal sector
 - Strategic options: As regulator and facilitator.
- The SEAP is to be integrated with:
 - Other action plans in the municipality (municipal development plans, plans for agriculture etc.)
 - Development plans of neighboring municipalities
 - With the national (governmental) plans

Example of SEAP Implementation City of Solrød



SEAP target of Solrød

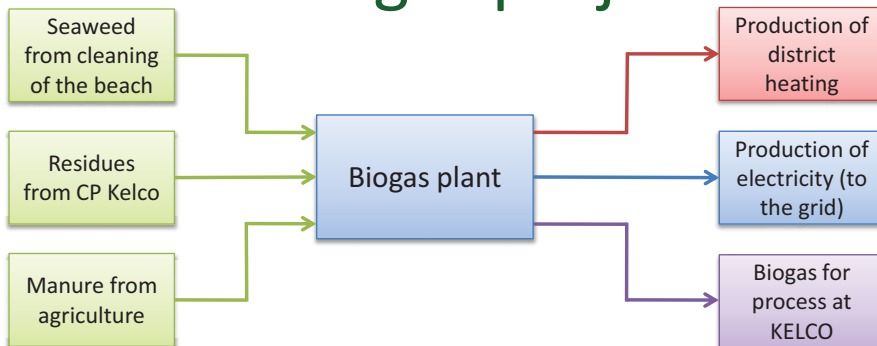
CO2 emissions



Identified key action: Making use of biomass residues for biogas production



Biogas project



Climate impact

- Total reduction of 30-40.000 tonnes CO₂-eq
- Conversion of district heating from natural gas to biogas
- Conversion from individual natural gas to district heating
- Electricity production (CHP)
- Biogas replaces process energy at the Kelco company
- Reduction in methane from manure

Other env. impact

- Reduction of nitrogen in the water environment
- Reduced odor from seaweed (along the beach side)
- Improved fertilizer for local agriculture (replaces synthetic fertilizer)
- Energy exploitation from industrial waste (Kelco)

Feasibility

- Improved economy for local agriculture
- Improved economy for Kelco
- Better options for tourist income (clean beach)
- Independence from increasing gas & oil prices

Biogas project - Conclusion



- A biogas plant can be realized based on seaweed, organic waste and manure with a healthy economy, and significant environmental benefits
- Biogas utilization of cast seaweed is valuable due to nutrient removal and reduction of methane emissions caused by degradation on the beach
- Realization of a biogas plant is very likely

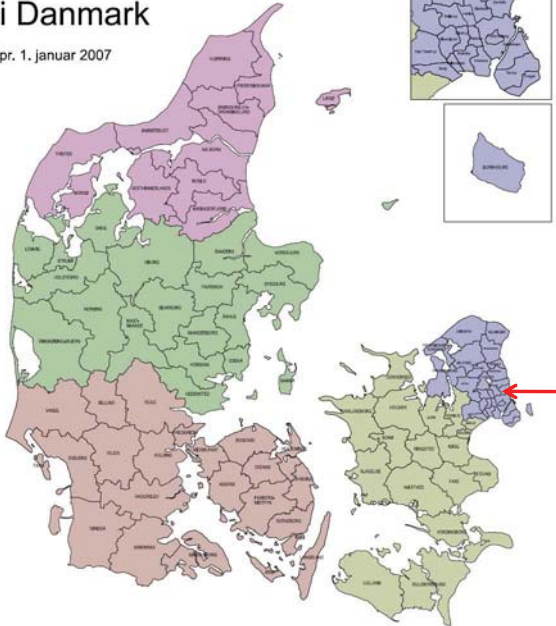
Next step



Example of SEAP Implementation City of Albertslund (suburb of Copenhagen)

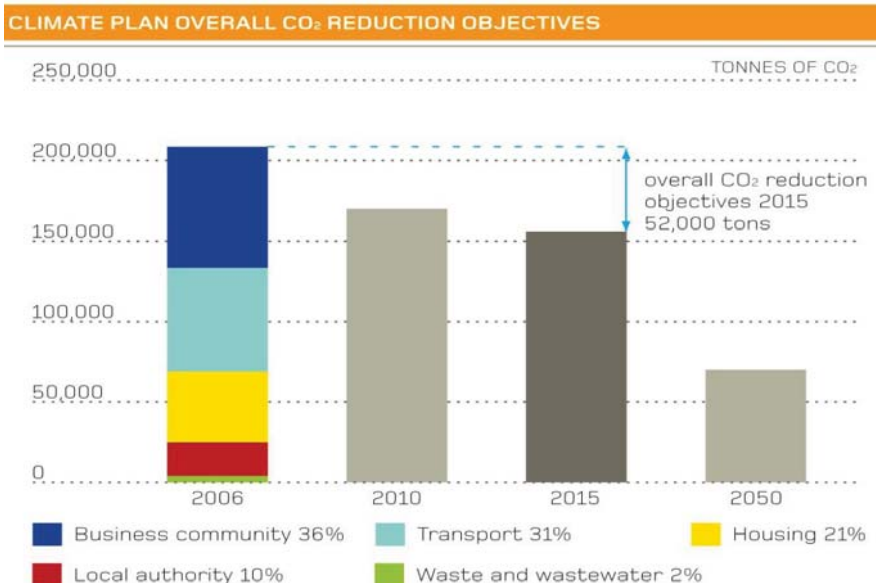
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CLIMATE ACTION – rethinking the city

- Albertslund in a new and climate-friendly version - Climate and energy efforts are seen as part of a strategic development of the future city.
- More than 40 CO₂ related and crosscutting activities



New street lamp - with LED



THE A LAMP WITH LED - green and innovative partnership

The Albertslund Lamp is a design classic, designed for the new city in the 1960s.

The A Lamp has been designed for the new renovated city of the 21st century.

Cooperation and co-financing between the Municipality of Albertslund and a designer, a light technology research and development institute, a manufacturer, and an energy company.

A fine base for using experience for a major push towards energy-efficient renovation of existing lighting.

Awarded with the Danish ELFORSK research award 2009.



THE A LAMP **- for the renovated city**

The A Lamp is eco-friendly, energy-efficient and modern. It complies with all requirements for light quality, light effect, and energy efficiency.

Lower cost of maintenance, vandalism and less need for service.

60 A Lamps replace 80 Albertslund Lamps. Climate savings amount to 3 tonnes of CO₂ yearly, the City saves DKK 8,500 (approx. EUR 1,150), and payback time is 7 years.

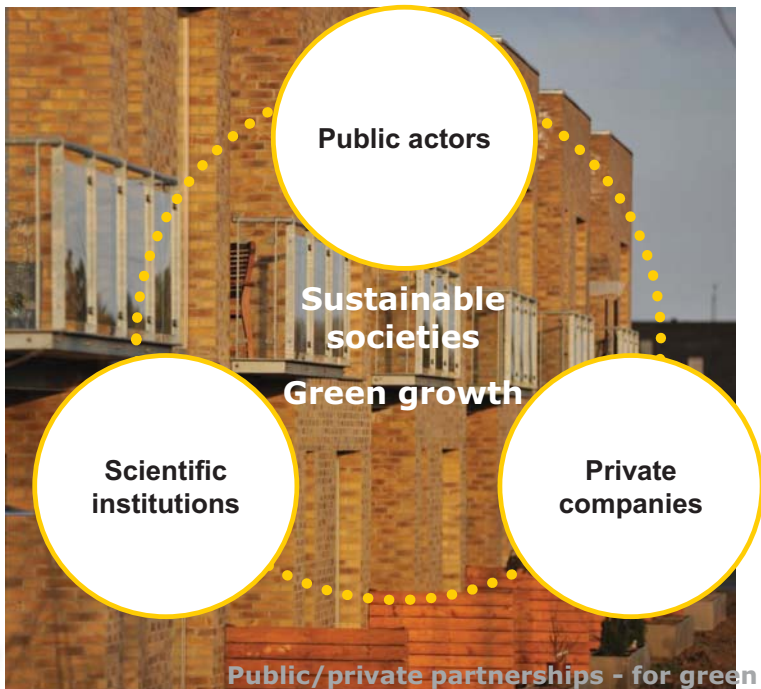
During the coming years 110 A Lamps will be installed in the City. And a LED tunnel lighting project is almost finished.

A large-scale production by Philips.



Accompanied by a public-private partnership: **GATE 21**

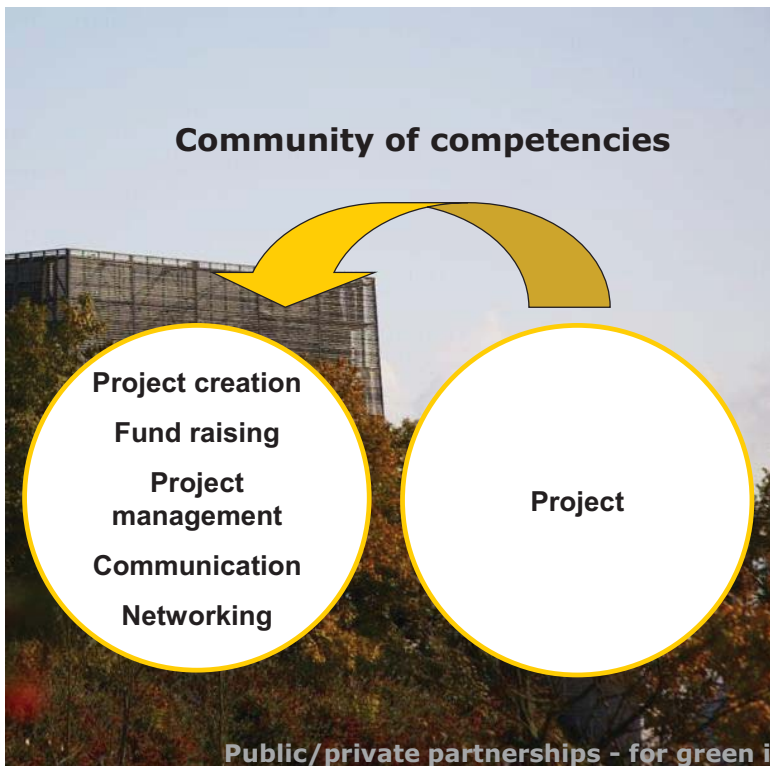
**Climate
Energy
Environment**



GATE 21
SUSTAINABLE FUTURE FORUM

GATE 21: a forum for realising projects.....

Develop
Test
Demonstrate



Highlight of COME2COM activities in Denmark

CoM city dialogue:

Hjørring, Solrød,
Albertslund, Odense
Fanø (island)
Frederikshavn on
acquisition &
GP/dissemination

De nye regioner og kommuner i Danmark

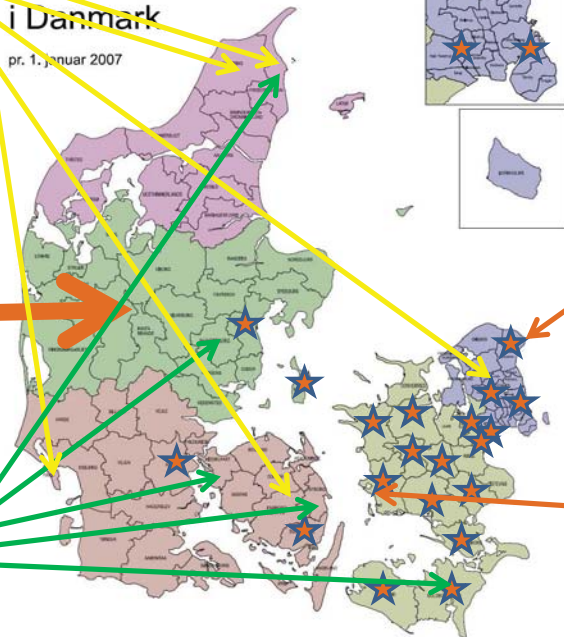
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CoM targeted promotion:

Acquisition of
municipalities in
Region Central DK.
Recent mission of
mayors to CoM
officials in Brussels

CoM promotion:

National events and
exhibitions



Got Helsingør on
board CoM & assist
on SEAP. Run GP
project on city staff
driven innovation



Energy day in the
city centre 13th
April

Assist Slagelse on
SEAP implementation
with focus on end-use
oriented activities

Summary - Conclusion

- Region Zealand has been pioneer region with 14 municipalities becoming joint CoM members
- University of Roskilde/RUC developed CoM methodology and assisted on SEAP development
- Via the IEE COME2COM project efforts are now made to overcome other municipalities' hesitation
- This is accompanied with supporting SEAP development and extracting Good Practice
- Main barriers appear to be the administrative burden of CoM participation and lack of resources
- Main drivers appear to be opportunities for EU contacts/projects, access to financing and city exposure

Thank you for your attention !

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