How to support innovations through urban experimentation
- Malmö’s innovation journey towards a sustainable energy system

Jonas Kamleh, strategist
Disposition

Why are working on making Malmö sustainable

Our goals

How are we doing it

What are we working on and some results we can see

Can we make sustainable cities a reality and what are some key challenges we face

Malmö. It starts here
Energy production and use account for 66% of global GHG emissions.

Source: IEA
Environmental Programme

Swedish’s most climate-friendly city

– By 2020 the municipal organisation will run on 100% renewable energy.
– By 2030 the whole municipality will run on 100% renewable energy.
– Energy consumption will decrease with 20% per person by 2020, and further 20% by 2030.
– Greenhouse gas emissions will decrease by at least 40%, calculated from 1990.
– Transition in transport and travel.
– Sustainable urban development.
– Resources will be used more wisely.
– The city will be cleaner and quieter.

Malmö. It starts here
Malmö. World leading in developing the sustainable urban systems of the future.

<table>
<thead>
<tr>
<th>Year</th>
<th>Climate neutral organization</th>
<th>HELT HUNDRA 100% renewable or recycled energy</th>
<th>Malmö's energy system: 100% RENEWABLE ENERGY</th>
<th>Sweden: 100% RENEWABLE ELECTRICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2040</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Malmö. It starts here
The great challenge

Malmö’s population keeps increasing, but resources are finite

Malmö. It starts here
How do we make change happen..

Not waiting for the perfect solution

Elements for making it happen:

- Externally funded project driven innovation
- Experiment
- Visions & goals
- Leadership & courage
- Malmö as a test bed
- Optimizing at a system level
- Partnerships

Malmö. It starts here
Malmö as a testbed…

...is a physical and virtual environment where companies, academia and other organisations can collaborate in the development and testing of new products, services, processes or organisational solutions to ensure a sustainable energy system in Malmö.

Energy efficiency

<table>
<thead>
<tr>
<th>Total</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>€23 M</td>
<td>€10 M</td>
</tr>
</tbody>
</table>

Industrial symbiosis

<table>
<thead>
<tr>
<th>Total</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>€5 M</td>
<td>€3,3 M</td>
</tr>
</tbody>
</table>

The energy systems of the future

<table>
<thead>
<tr>
<th>Total</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>€23 M</td>
<td>€7 M</td>
</tr>
</tbody>
</table>

Malmö. It starts here
Malmö as a testbed…

...is a physical and virtual environment where companies, academia and other organisations can collaborate in the development and testing of new products, services, processes or organisational solutions to ensure a sustainable energy system in Malmö.

Malmö. It starts here.
### Municipal partnerships for urban development

<table>
<thead>
<tr>
<th>Non-profit organisations with a theme</th>
<th>Ambition-agreements</th>
<th>Developer dialogue</th>
<th>Collaborations for urban area improvements</th>
<th>Joint enterprise for neighbourhood development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scandinavian Green Roof Association (sedan 2001)</td>
<td>Declaration for local sustainable development in Sofielund (2017–?)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Joakim Nordqvist, et al. City of Malmö/Malmö University
Malmö Energy System:
https://www.youtube.com/watch?v=vqg-5sJ-qf8
Example of results

Energy efficiency

• - 50% delivered energy
• - 20% primary energy
• Pre investment 166 kWh/m² post investment: 71 kWh/m²
• Dubbled property value
• Local job creation
• Affordable renovation

Smart energy system

• Smart energy plattform developed
• Capability to load balance heat developed
• +1000 buildings connected by 2020
• Additional capability to load balance electricity
• Living partnership
URBAN SYMBIOSIS

URBAN SYMBIOSIS: https://www.youtube.com/watch?v=-xK7zUb4k0
In Malmö's Port Area We Share

– enhanced competitiveness through industrial symbiosis!
Governance without borders
Governance without borders

System owners

The City

The City

The Case

Malmö. It starts here
Governance without borders
Governance without borders

System owners

The City

The Case

Malmö. It starts here
From I to WE

Hepp!

Strong alone?

Malmö. It starts here
From I to WE

Innovation & business opportunities

Malmö. It starts here
From I to WE

50% increase of waste heat to grid

Knowledge sharing
Innovation & business opportunities

Malmö. It starts here
Utility management to Resource Management

- Waste Prevention
- Sorting & Collecting

- Efficient Waste Treatment
- Energy Recovery

- Energy Solutions
- Renewable & Recovered energy

Malmö. It starts here
Utility Management to Resource Management

Malmö. It starts here
City futures – Collaboration between Science and Society for Sustainable Solutions

What’s next?
Reflections

2020: broken the GHG curve

2030: 50%

2050: climate neutral

Goal 1.5°C – 2.0°C

Malmö. It starts here
Reflections

Point innovations

System innovation

Malmö. It starts here
Malmö as a testbed
...is a physical and virtual environment where companies, academia and other organisations can collaborate in the development and testing of new products, services, processes or organisational solutions to ensure a sustainable energy system in Malmö.

Innovations
Innovations is about finding new or improved ways to create value for society, companies and individuals. Through innovations we can do more with less. Strengthening sustainable development. Additionally innovations are needed to solve local, national and global societal challenges.

Innovations capability
Our businesses and society face challenges that requires a capability to do and think new today and in the future. Malmö’s citizens, businesses and organisations needs to strengthen their ability to transform knowledge, competency and experiences to new and improved products, services and business models – we need to become more innovative.

Malmö – det börjar här.
City futures – Collaboration between Science and Society for Sustainable Solutions

The Golden Circle

**What**
Every organization on the planet knows WHAT they do. These are products they sell or the services they offer.

**How**
Some organizations know HOW they do it. These are the things that make them special or set them apart from their competition.

**Why**
Very few organizations know WHY they do what they do. WHY is not about making money. That’s a result. It’s a purpose, cause or belief. It’s the very reason your organization exists.

Simon Sinek, Ted Talk

Malmö. It starts here
Climate neutral organisation 2020

2015
62%

2020
98-99%
Vårt arbetssätt

1. Nuläge
2. Insatser
3. Effekter
4. Mål
5. Kommande mål

Malmö. It starts here
City futures – Collaboration between Science and Society for Sustainable Solutions

The Golden Circle

Reflections

Malmö. It starts here
Can sustainable cities become a reality?
The great transformation

Bo01 – from has-been to world renowned
Thank you.

Jonas Kamleh, strategist
Environmental department, City of Malmö
jonas.kamleh@malmo.se +46 709 118 310
Swedens consumption based footprint

Food 32%
Housing 21%
Transport 31%
5 12%
Public consumption and investments

Clothes, shoes
Other

2/3
7.5 tons

1/3
3.75 tons
Future collaboration arenas

Data, information, knowledge – wisdom

WHY-HOW-WHAT
The Swedish Local Government Act

Local government act powers
Municipalities have to have certain functions according to law. Other functions are on a volunteer basis and are decided by local politicians.

Examples of mandatory municipal functions
- Preschools and recreation centers
- Pre-school class, elementary school, upper secondary school and special school
- Municipal adult education
- Swedish for immigrants
- Social services, including individual and family care
- Caring for the elderly and the disabled
- Health and special care in special housing
- Urban Planning and Building
- Health and environmental protection
- Cleaning and disposal
- Emergency services
- Water and sewer
- Library
- Emergency Management
- Public transport (along with county councils)
- Housing
- Social orientation for some newly arrived immigrants

Examples of voluntary municipal functions
- Öppen förskola
- Fritidsverksamhet
- Bygga bostäder
- Energi
- Hälsa- och viss sjukvård i hemmet
- Sysselsättning
- Näringslivsutveckling
- Kultur
Prerequisites for successful partnerships

Source: Joakim Nordqvist, et al. City of Malmö/Malmö University

Malmö. It starts here
Test bed and focused development areas

- Industrial symbiosis
- Retrofit
- Smart grids
# Industrial symbiosis

- Stimulate and attract green growth in Malmö
- Contribute to that the harbor area becomes more attractive to investments
- Demo area strengthens the competitiveness
- Increased transition from fossil to non-fossil fuels
- Resource flows and tests of potential
- Increased resource efficiency
Thermal gasification

Chemicals

Pellets

Phosphorus and/or metal recovery

Algae, insect, or mushroom cultivation

Food cluster
# Smarta grids

- Cooperation EON, VA SYD and City of Malmö
- Developing the energy system of the future
- Visualization of energy use
- Individual measuring
- Steering based on price and availability of renewable energy
Movie
Vision

Hyllie will develop into the most climate smart district in the Öresund region and become a global role model for sustainable urban development

- 100% renewable or recycled energy
- Climate smart lifestyles
- Sustainable mobility
- Smart grids
- Energy efficient buildings
# Energy efficiency

Vårsången

400 apartments / 1000 tenants
Retrofit
Building climate shell
  • Laundry facilities
  • Elevators
  • Windows
  • Roof

Technical installations
  • Low energy lightning
  • Solar cells
  • Upgrade/optimization of district heating sub-central
  • Updated BMS
  • New monitoring equipment for water consumption
  • FTX
Before investment
166 kWh/m²

Energy saving
95 kWh/m²

Future consumption:
71 kWh/m²

- 50% delivered energy
- 20% primary energy
Purchased at EUR 750/m²
Now valued at EUR 1550/m²
Cost effective EUR 1700 / apartment
Estimated yearly societal value created:

EUR 760 000

10 tenants received jobs at Trianon

12 tenants received jobs at subcontractors/suppliers
To reach the goal of 9 billion high quality lifestyles by 2050, businesses need to embed sustainability into their business model.
Companies: what is your unique contribution to a sustainable future?
Maximal welfare within Malmös planetary boundaries allocation
Malmö in numbers

The Swedish Local Government Act

Budget 2018 - 18 698MSEK

Climate 8MSEK

= 0.032%
How do we make change happen..

Not waiting for the perfect solution

**Elements for making it happen**

- Malmö as a test bed
- Unleashing creativity
- Experiment
- Leadership & Courage
- Visions & Goals
- Partnerships with businesses
- Optimizing on a system level
- Attracting the best & brightest
- Externally funded project driven innovation

**Visions & Goals**
What does a public servants do?

1. Execute political decisions

2. Through dialog support the competency to act/quorate for our local politicians and other decision makers