



CITIES

Centre for IT Intelligent Energy Systems



Innovationsfonden

FORSKNING, TEKNOLOGI & VÆKST I DANMARK

Potential Student Projects in relation to CITIES



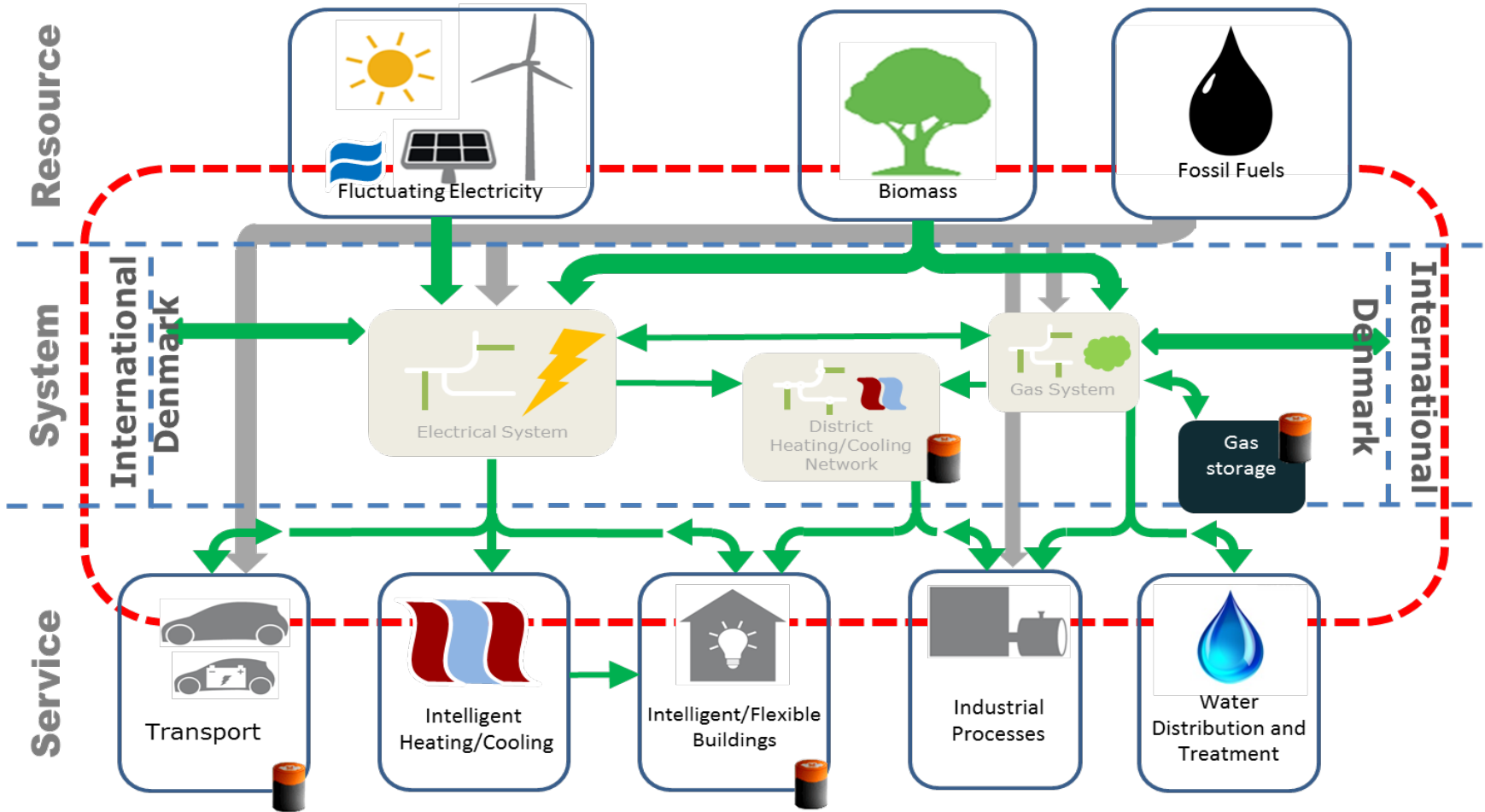
Software Engineering (02162)

December 5th 2014

Ivan T. Herrmann and Alfred Heller



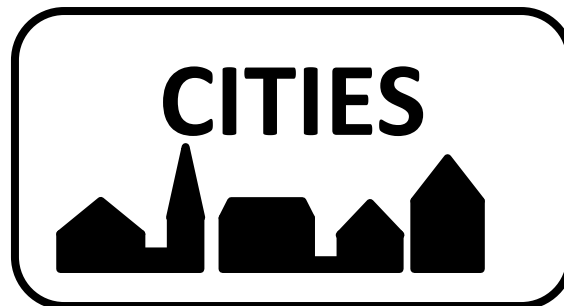
CITIES Focus



CITIES Hypothesis

The central hypothesis of CITIES is that by **intelligently integrating** currently distinct energy flows (heat, power, gas and biomass) in urban environments we can enable very large shares of renewables, and consequently obtain substantial reductions in CO₂ emissions.

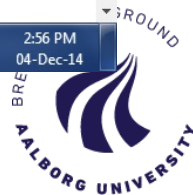
Intelligent integration will enable **lossless 'virtual' storage** on a number of different timescales.



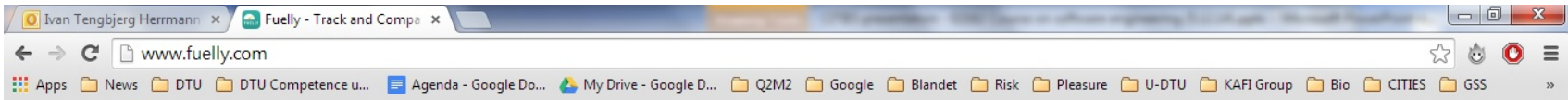
Example 1: www.fuely.com



The screenshot shows a web browser window with the URL www.fuely.com. The browser's address bar and tabs are visible at the top. The website's main content area has a teal background. On the left, there is a fuel pump icon, the word "FUELLY" in large white letters, and the headline "Track, Share, and Compare your Vehicle." Below this, a smaller text block reads "Understanding your fuel consumption and vehicle's actual costs can help you save big money." A white button with the text "IT'S EASY AND FREE. JOIN FUELLY TODAY." is positioned below the text. To the right of the button is a "PLAY VIDEO" link with a play icon. In the top right corner of the website, there are links for "BROWSE VEHICLES", "JOIN FUELLY", and a "LOG IN" button. On the right side of the page, there is a bar chart with several white bars of varying heights, and one bar is highlighted in orange. Below the chart, a car icon is shown with a vertical line extending upwards from it, passing through the orange bar in the chart. At the bottom right of the website, the text "DRIVE SMARTER." is displayed in orange. The browser's taskbar is visible at the bottom, showing various application icons and the system clock.



www.fuely.com



ACCESSIBLE ANYWHERE.

Fuely is a site that tracks your gas mileage over time, helping you calculate fuel expenses as you drive.



Easily add your vehicle and then track your fill-ups from via our web, apps or SMS.



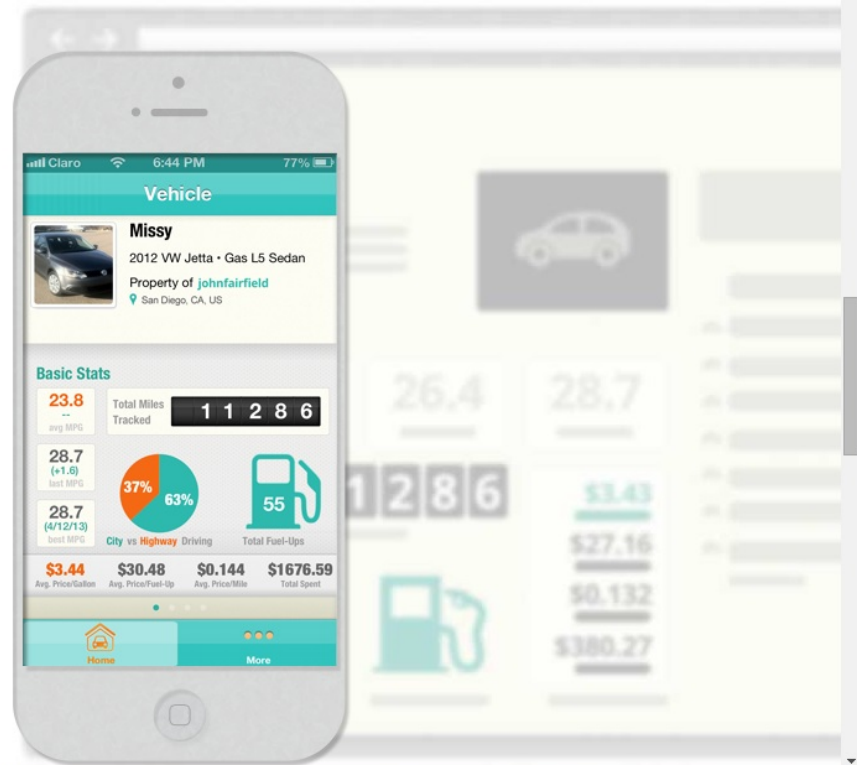
View reports on your vehicle to understand your actual costs.



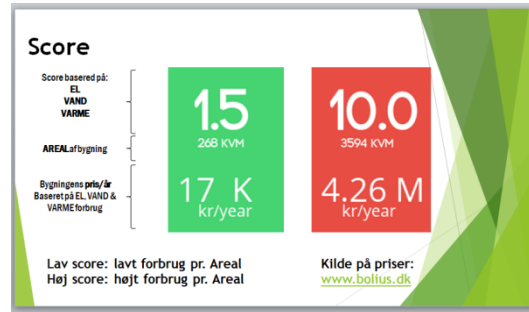
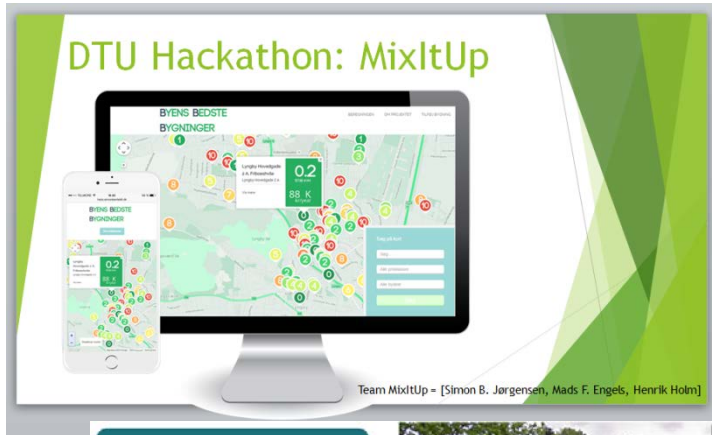
Compare your results over time to understand how your vehicle is performing.



Help others understand the real world costs of each vehicle which helps consumers make better choices.



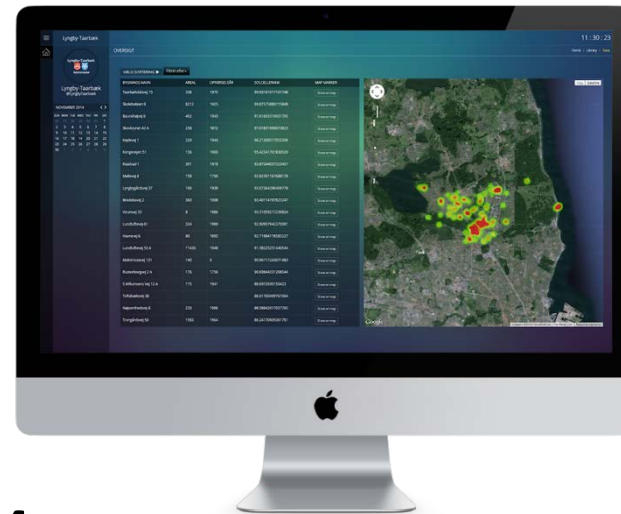
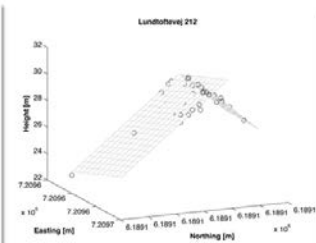
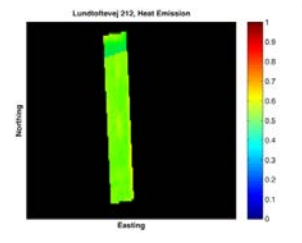
Example 2: What's possible in two days?



Team FancyPants

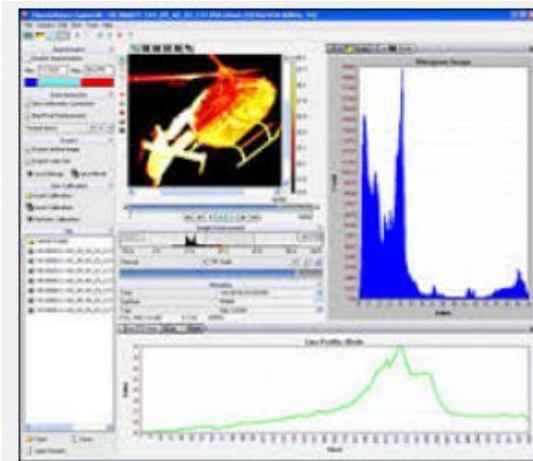
Anders Nielsen
Benjamin Hughes
Daniel J. Bertelsen
Lars Bonde
Maxim Khomiakov
William Gan

We combined data from thermography maps with the application of the Danish Altitude Model



- ✓ Big Data Hackathon 2014
- ✓ Both winners used energy, cities, and data

Example 3: Visualisation – Control screenes – State of Green Photo

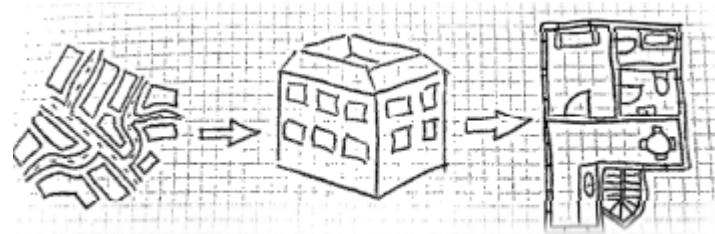


Example 4: Master Theses – Data Visualisation



Brugervenlig visualisering

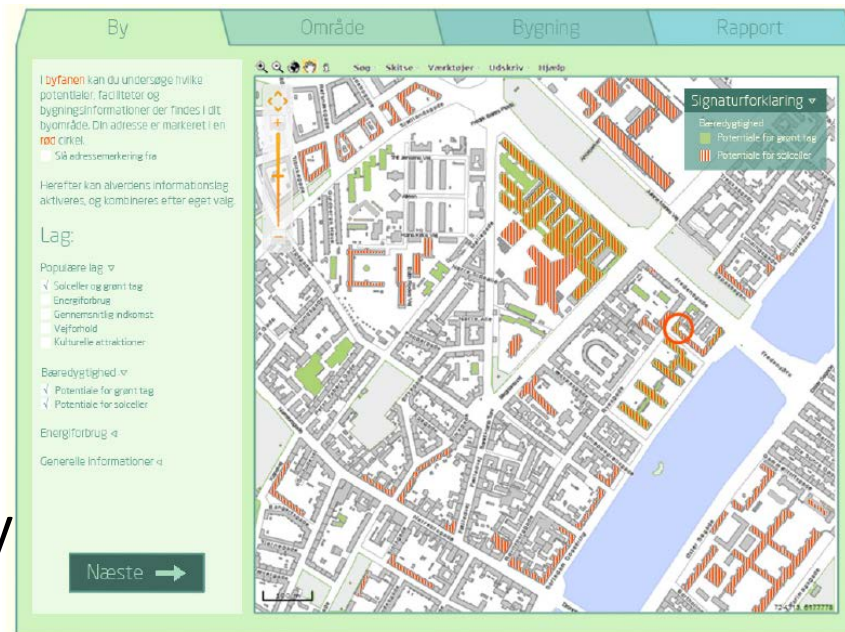
Af byplans- og bygningsspecifik data



Zoom into data:
GIS>BIM>Plan>Component>...

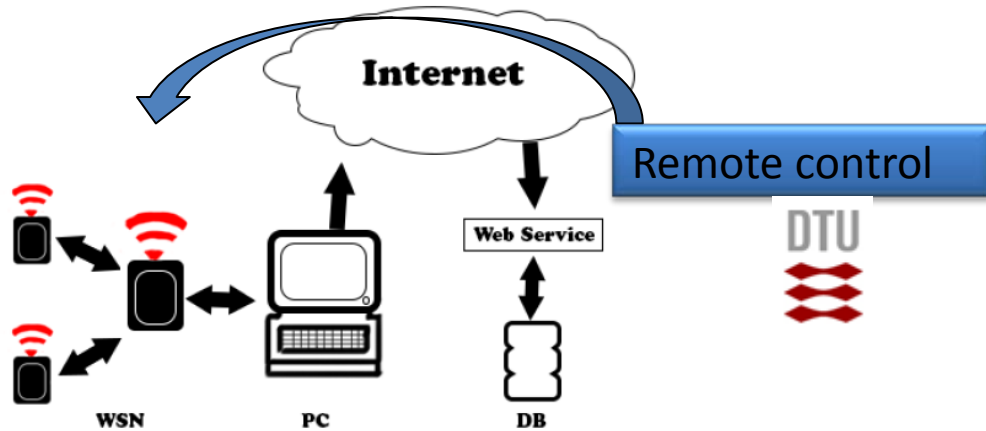


DTU Mads Harding Møller s093341
Lærke Philipsen s093375



✓ Automatic calculation of energy labeling

Example 5: Data collection <-> control



Apisseq, Sisimiut - Greenland



- Communication sensors transfer data to databases
 - E.g. a local database (PC)
 - E.g. over the internet to a central database (DB, collection)
 - E.g. over the internet to a “cloud database”
- If you can control the data flow in one direction, then you (usually) also can do it in the other direction
 - Control and remote control

Example 6: Knowledge city – Lyngby, Smart Campus DTU

- SensibleDTU - <https://www.sensible.dtu.dk/?lang=en>
- In collaboration with Niras company develops the first "Big Data" platform
 - GIS for Visualisation and localizing
 - Buildings
 - Building projects activities
 - Ressource- and energyconsumption
 - Movements of people (positioning)
 - Why?
 - Save ressources and money
 - In operation
 - In the management of Construction Projects
 - In energy- and ressource consumption
 - Facility Management
 - Etc.
- Smart Allé DTU – Innovationsplatform at

UDBYGNINGSPLAN 2009 - 2020





Ea Energy Analyses



Partners



KØBENHAVNS KOMMUNE



Horsens Varmeværk



AARHUS KOMMUNE



Test Facilities

- ESIF (NREL, USA) 
- Kubic (Tecnalia, Spain) 
- DH facilities in S. Korea 
- Ireland 
- PowerLab.dk (SYSLAB/Bornholm) 
- Grundfos test buildings 
- Danfoss test facility for supermarket cooling 
- DTU's test houses 
- **+ A number of Smart Cities projects**

