

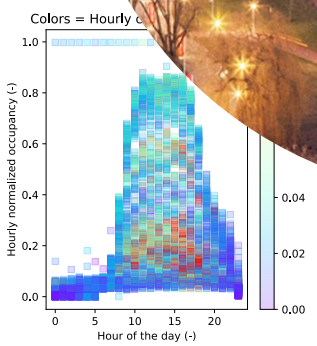
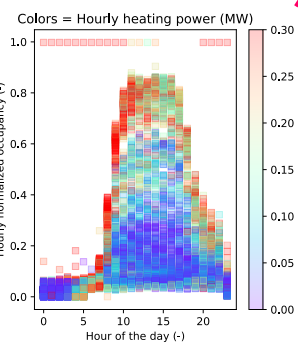
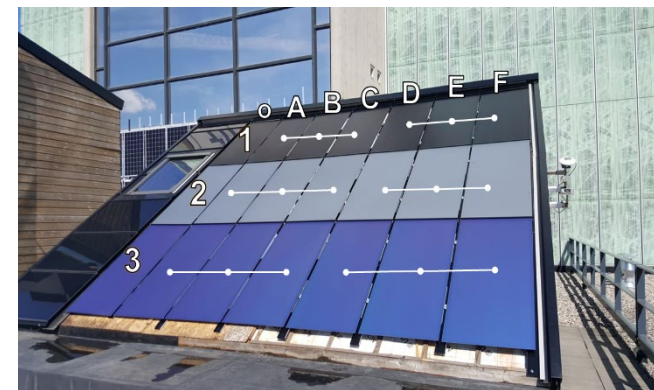
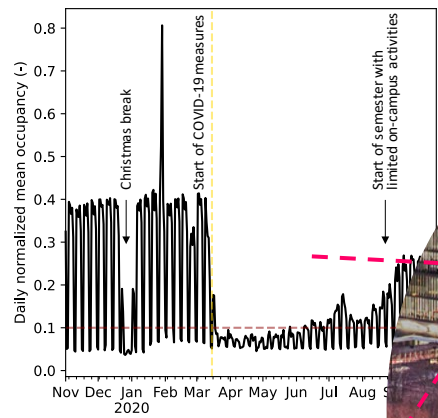


# Building Physics and Services

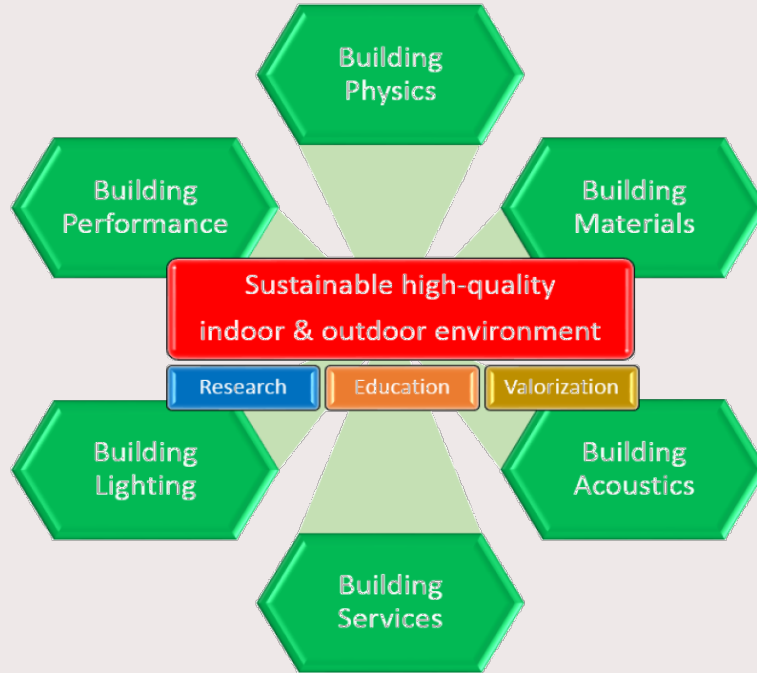
12 SEPT 2022

dr.ir. Roel Loonen

Department of the Built Environment



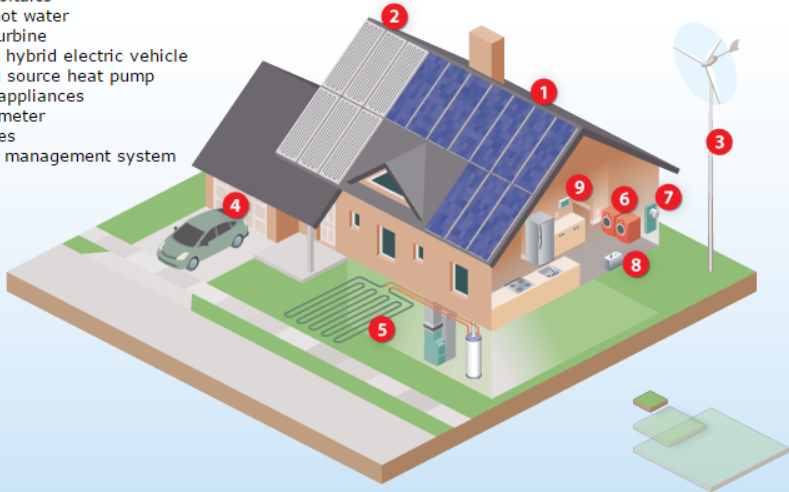
# Building Physics and Services



# From building material to urban scale

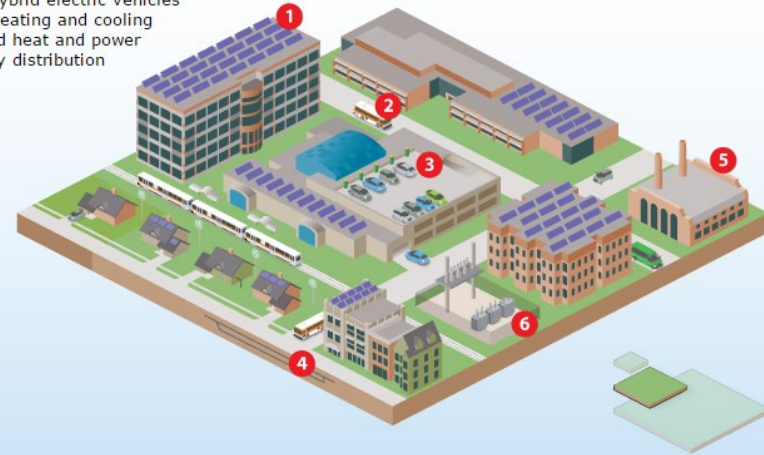
## Technologies

1. Photovoltaics
2. Solar hot water
3. Wind turbine
4. Plug-in hybrid electric vehicle
5. Ground source heat pump
6. Smart appliances
7. Smart meter
8. Batteries
9. Energy management system

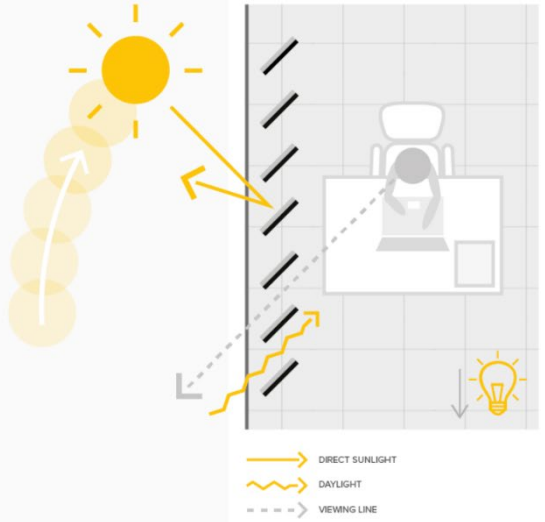


## Technologies

1. Photovoltaics
2. Fleets and mass transit
3. Plug-in hybrid electric vehicles
4. District heating and cooling
5. Combined heat and power
6. Electricity distribution



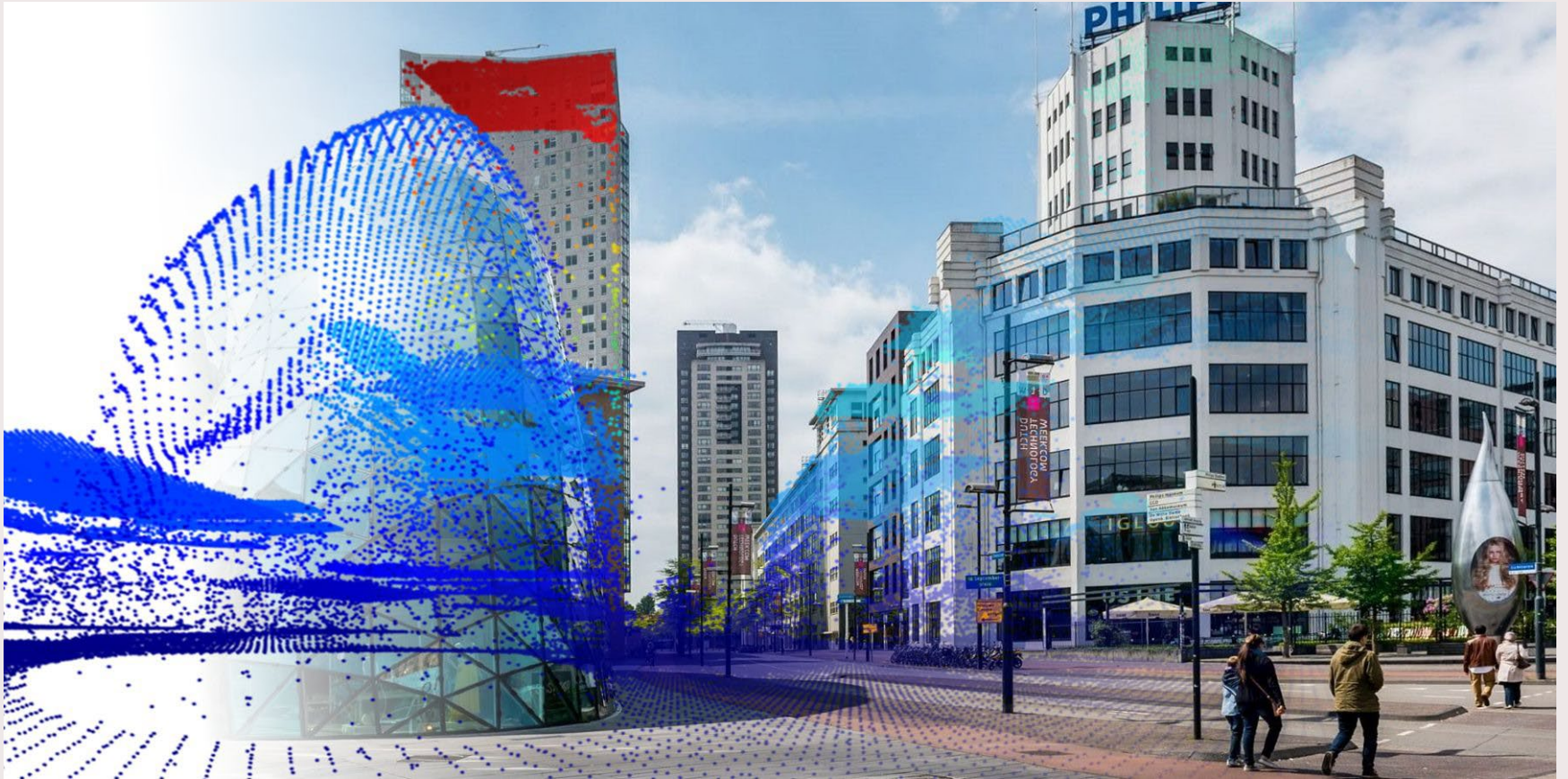
# Solar building envelopes



## Automated suntracking

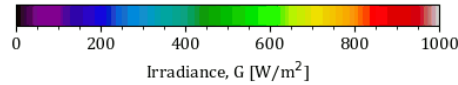
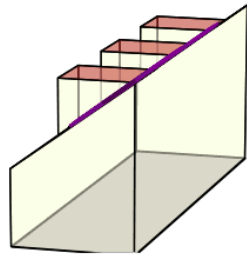
Blinds will follow the sun, allowing for more view and daylight. This results into higher productivity and energy savings while people do not have to waste time on manual blind control anymore. Furthermore, all blinds will automatically be in the same position, resulting in a clean, professional appearance for the building facade.



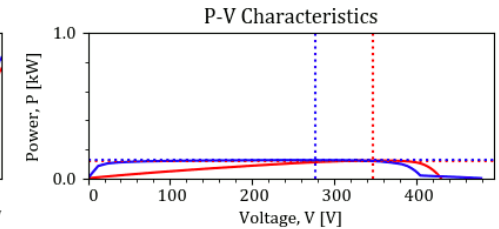
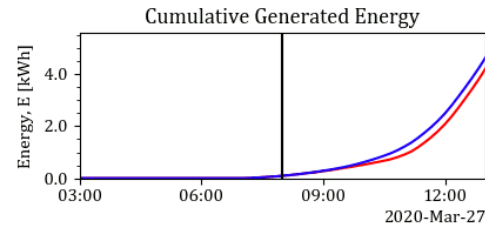
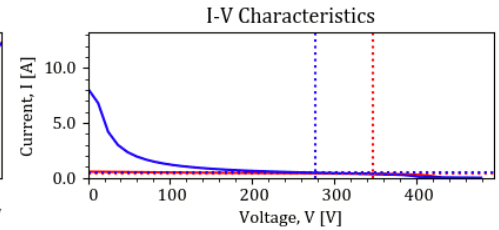
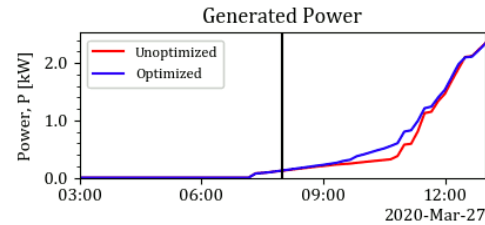
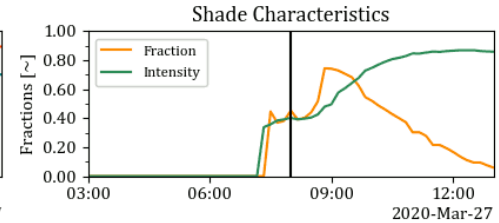
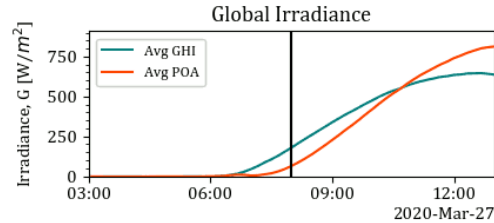


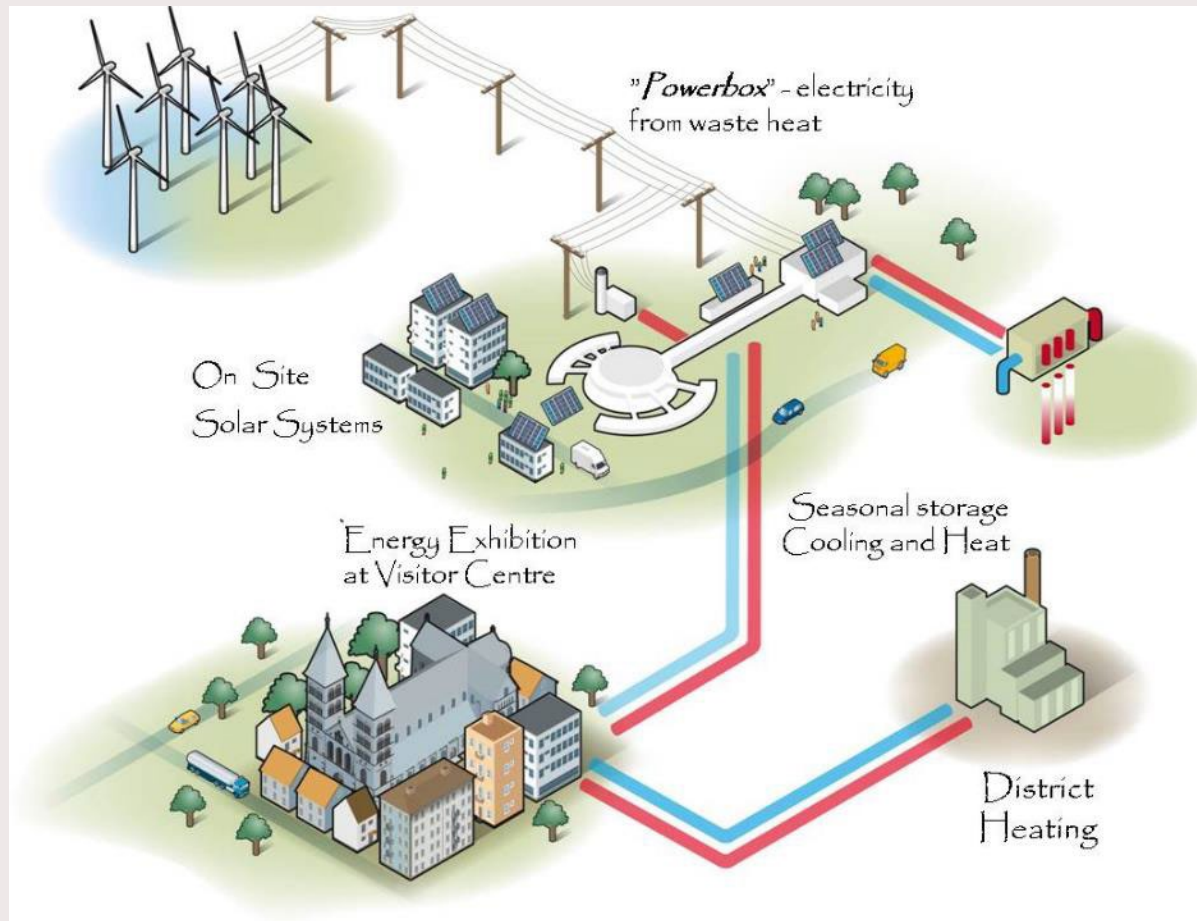
# Renewable energy systems in context

Timestamp: 2020-Mar-27 - 08:00

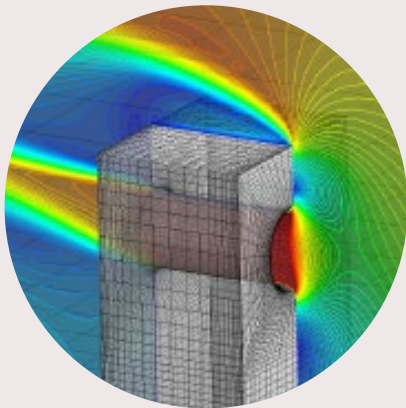


	Power [kW]	Day Yield [kWh]	Total Yield [kWh]
Unoptimized	0.12	0.09	0.09
Optimized	0.13	0.09	0.09
Difference	0.01	0.0	0.0









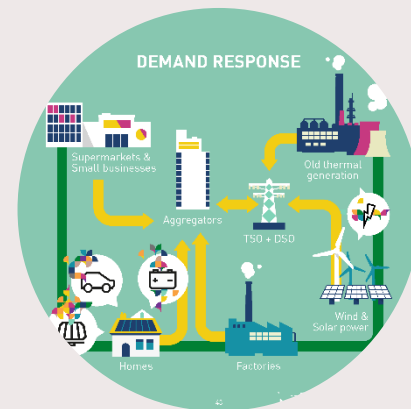
Building integrated wind energy harvesting



Energy retrofits for social housing



Electrical and thermal storage in buildings



Energy flexibility

# More information

Please contact me for more information: [r.c.g.m.loonen@tue.nl](mailto:r.c.g.m.loonen@tue.nl)

