

# Sustainable Digital Infrastructure

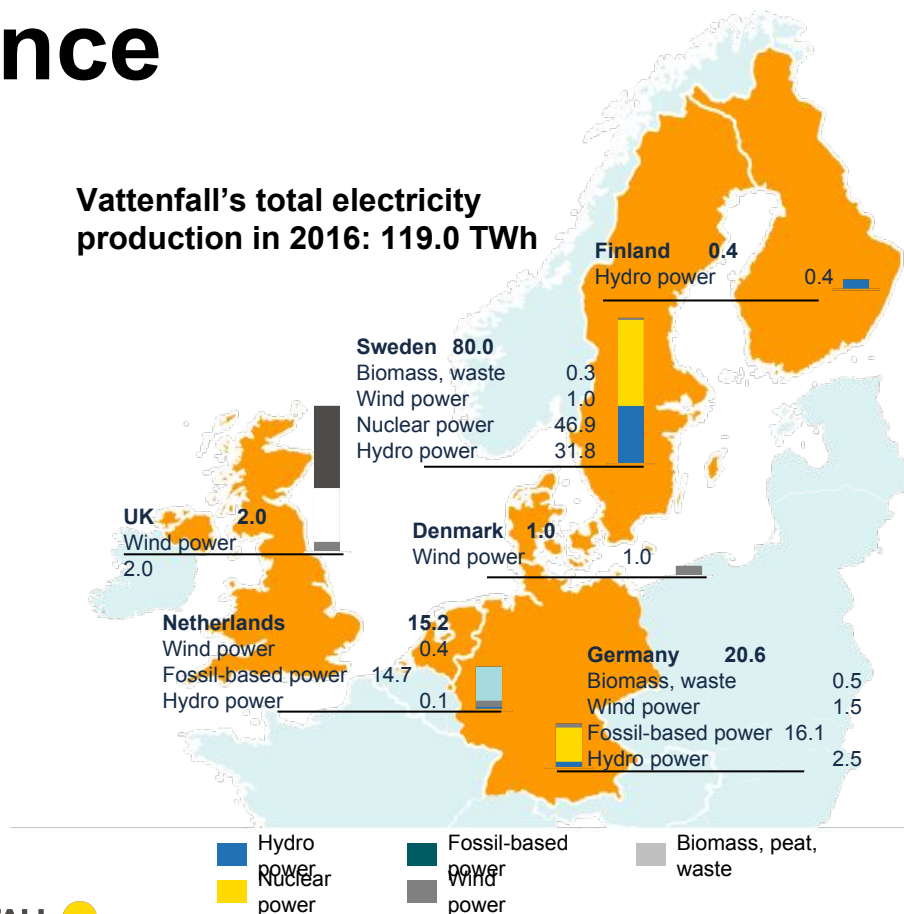
**Vattenfall Markets**

OpenShift Commons Gathering, 10<sup>th</sup> of December 2018, Max Schulze

# Vattenfall at a glance

- One of Europe's largest producers of electricity and heat
- 100% owned by the Swedish state
- Main products: electricity, heat, gas, energy services
- Main markets are Sweden, Germany, Netherlands, UK, Denmark and Finland
- 20,000 employees

## Vattenfall's total electricity production in 2016: 119.0 TWh

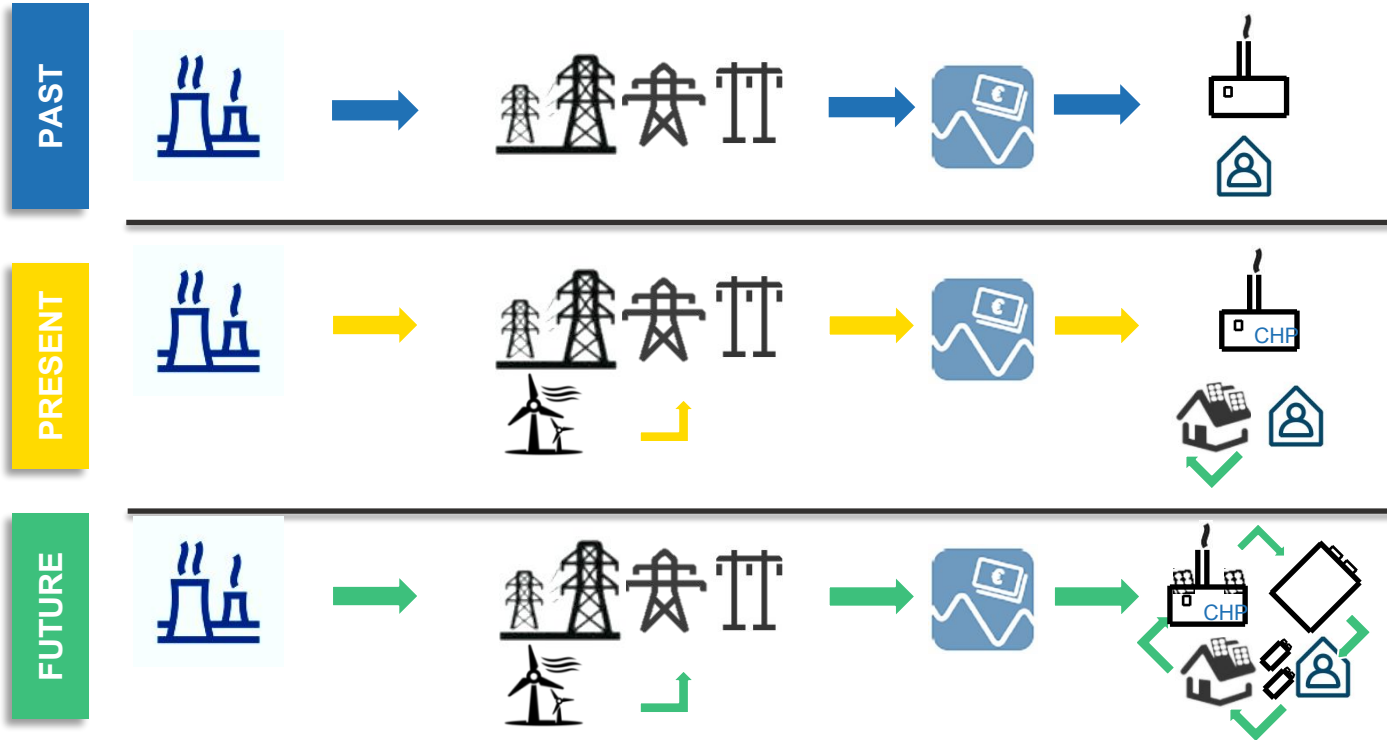




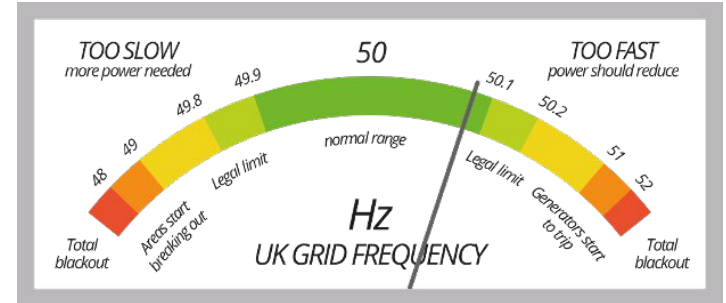
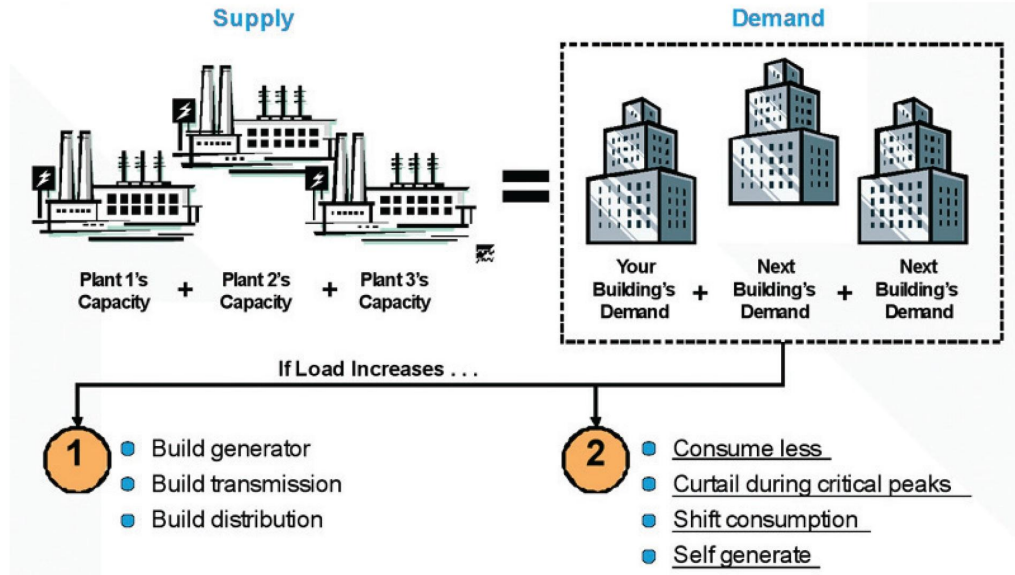


# Fossil free within one generation

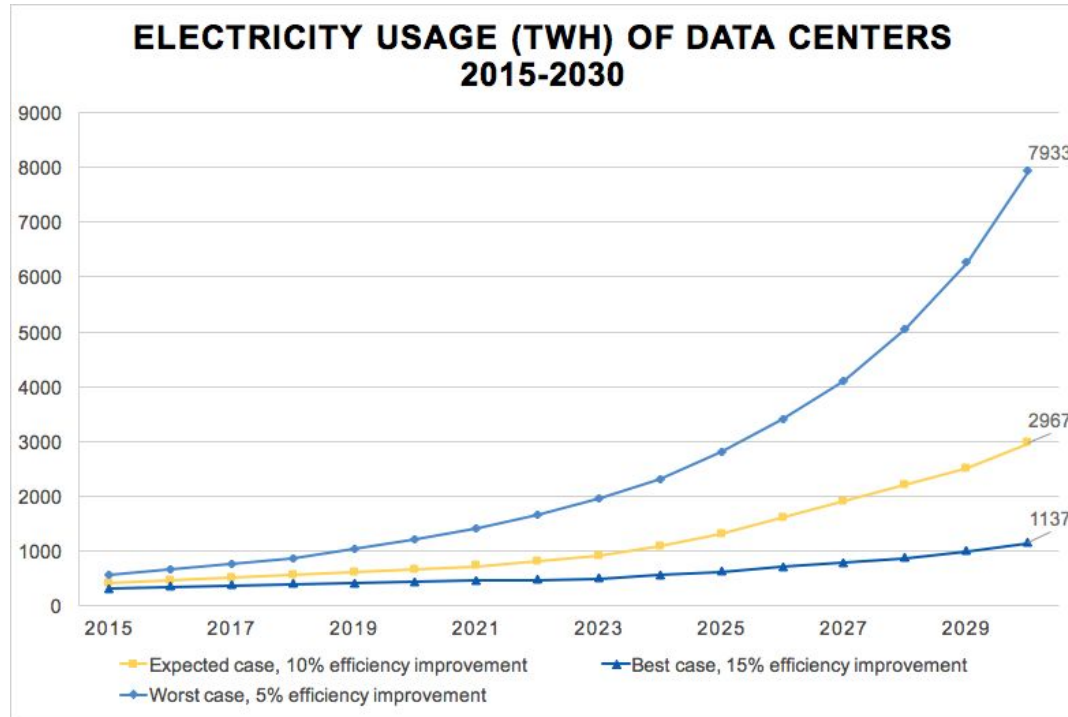
# Energy system is transforming



# Flexibility is a key enabler to ensure transition to renewables

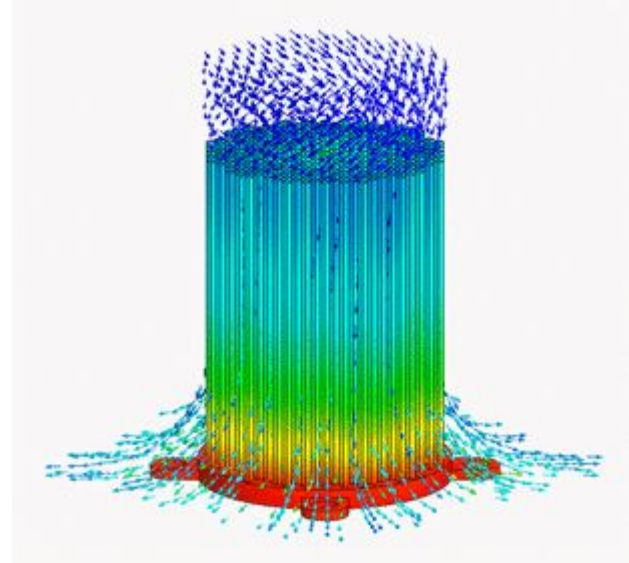


# Data Centers are large users of power



And: 99.9999%+  
availability needed.

# Silicon chips generate a lot of heat (~100% of input power)





# Together with partners, we are making it happen in Sweden.



**Purpose** = Real Sustainability > 80% heat recovery, flexible power consumption



Heating plants in Stockholm & Ludvika will host the two 5 MW demonstration data centers.



# Red Hat OpenShift & OpenStack to address challenges:

1 Generating **continues flow** of 60°C/140°F heat



2 **Distributing workloads** across locations based on predicted power availability



3 **Moving** large amounts (or parts) of **data across multiple locations** along with workload at acceptable speeds



# What's next?



**Fossil free** digital infrastructure around the world.

Open Source our **entire solution**, construction & documentation.

Build a **forum for the energy & technology** industry to work together.



# Thank you! Questions?