



How much is too much?

Hydropower Resilience under Prolonged Extreme Price and Precipitation events

Tilda Eklund & Tim Possekel

KTH & Vattenfall AB

Supervised by:

Uli Max Rahmlow (KTH) & Richard Scharff (Vattenfall AB)

Investigating the challenges for hydropower in a future energy system



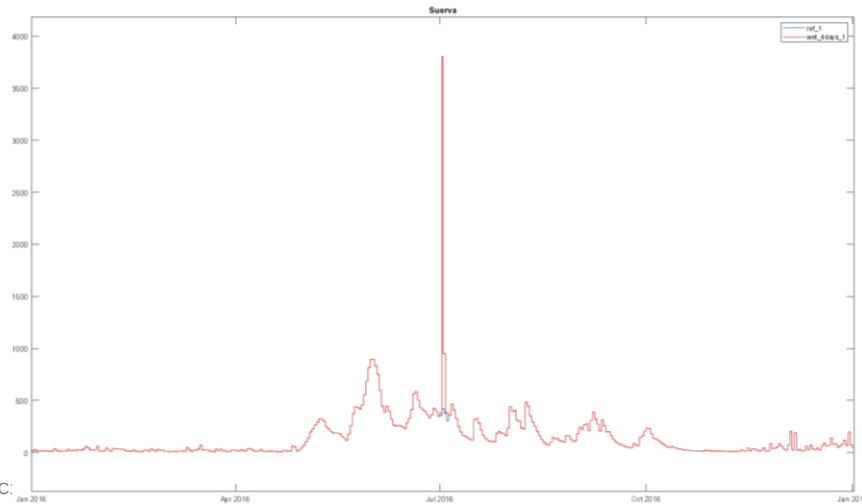
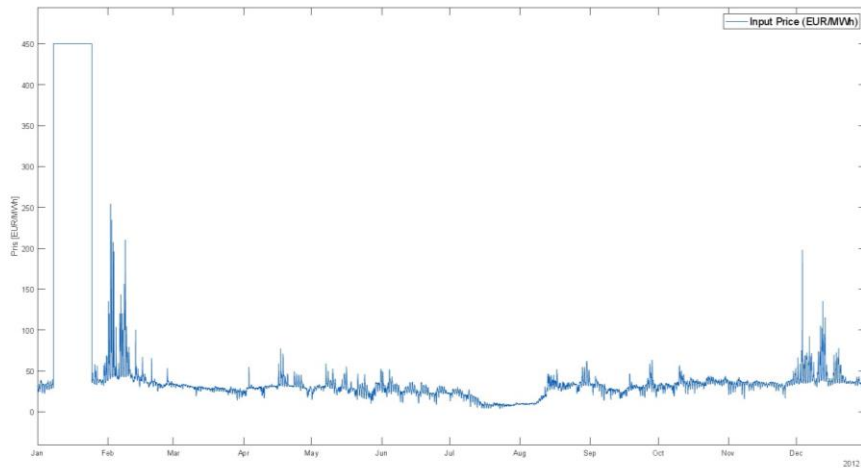
Research Questions

For how long can Swedish hydropower sustain maximum and minimum production?

How well can the current system handle extreme precipitation?

What factors influence these abilities?

Methodology



Inflow
Spot price
Reservoir levels



HydroProdPlan
Deterministic
Matlab-based tool
By Vattenfall R&D



Production
Discharge & spillage
Reservoir levels

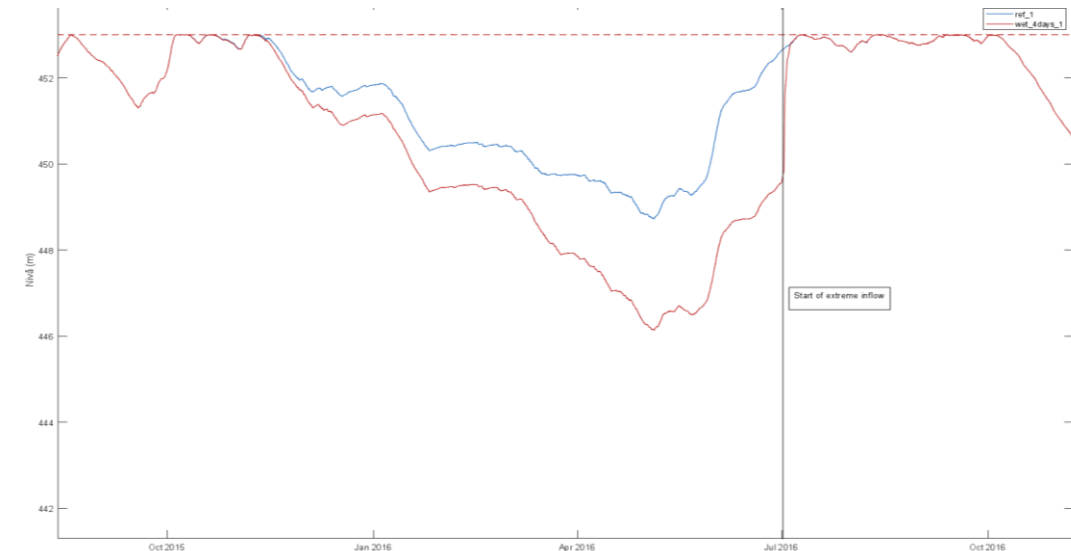
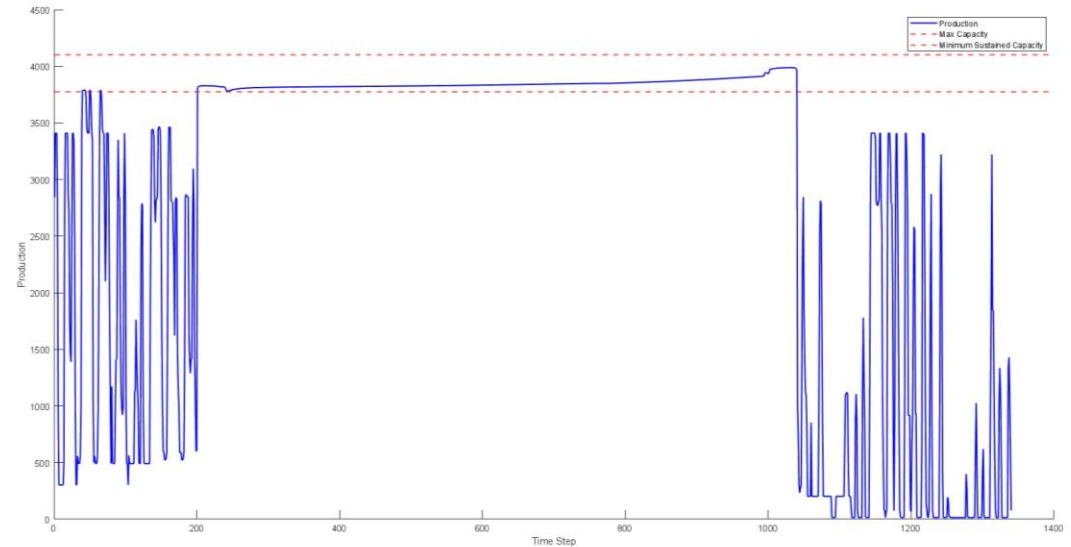
Proposed Measures for Analysis

Extreme price events

- Maximum Sustained Capacity
- Forced Capacity
- Spillage caused

Extreme precipitation

- Reservoir drawdown
 - When & how



Thank you for listening!

Feel free to contact us with questions and advice.

Extreme price events

- Tilda Eklund
- Tilda.eklund@vattenfall.com

Extreme precipitation

- Tim Possekel
- Tim.possekel@vattenfall.com

