

— COMSYS —

PERFECTING  
POWER

# 74<sup>th</sup> National Electricity Day

## Jakarta

# New grid, New challenges

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## The (im)possible equation

# **New grid, New challenges**

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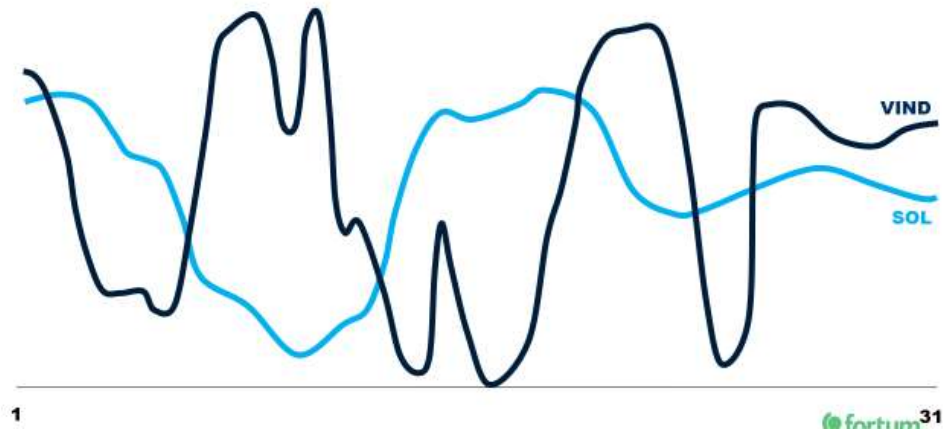
**The world will consume 75% more  
electricity in 2050**

# **New grid, New challenges**

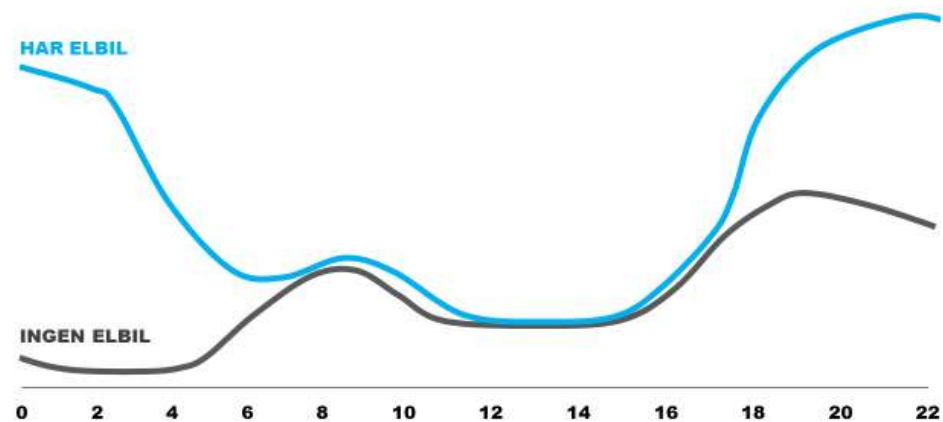
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**Dynamic power generation & usage  
makes grid operators start enforcing  
grid compliance**

# New grid, New challenges



Less rotating mass in production



Increased volatility in production

Source: Fortum, 2019

# New grid, New challenges

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**The power infrastructure to come**

**More flexible and small scale infrastructure**

**Our possibility => High quality grid interaction**

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- Based in Lund, Sweden
- Founded in 2001
- Privately held Company
- ISO 9001:2015 certified
- Is growing by over 30% per year during the last 5 years
- The ADF products are developed and manufactured in Sweden
- First ADF delivered in 2003. About 3 000 projects has been sold in over 50 countries since the commercial start in 2009



# Clients already making their energy more efficient with ADF

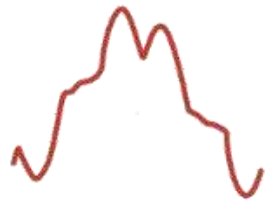




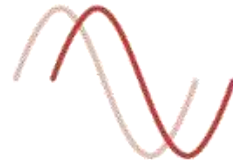


**Power isn't perfect**

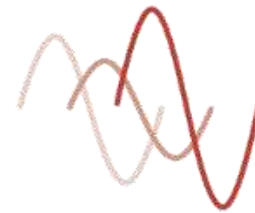
# When power is in no shape to perform



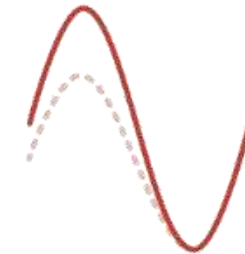
Harmonics



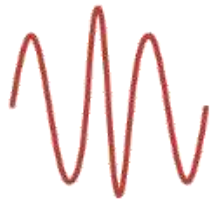
Reactive power



Network unbalance



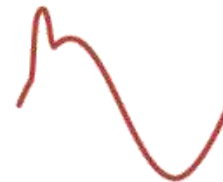
Voltage variations  
(dips, sags, swells,  
brown-outs)



Oscillations  
(resonances)

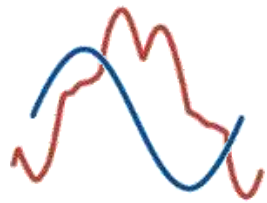


Flicker

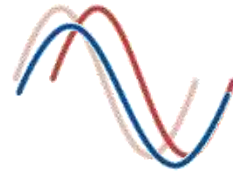


Transients  
(fast disturbances)

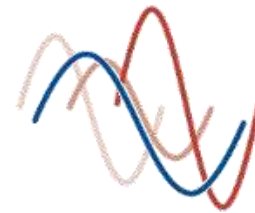
# ADF – technology that makes energy more efficient



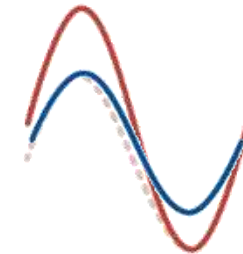
Harmonics



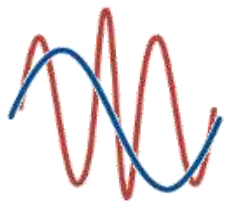
Reactive power



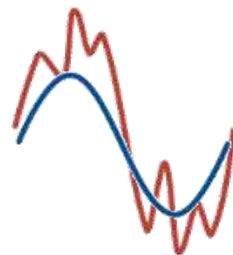
Network unbalance



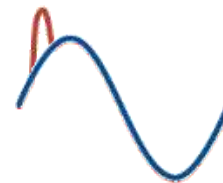
Voltage variations  
(dips, sags, swells,  
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Oscillations  
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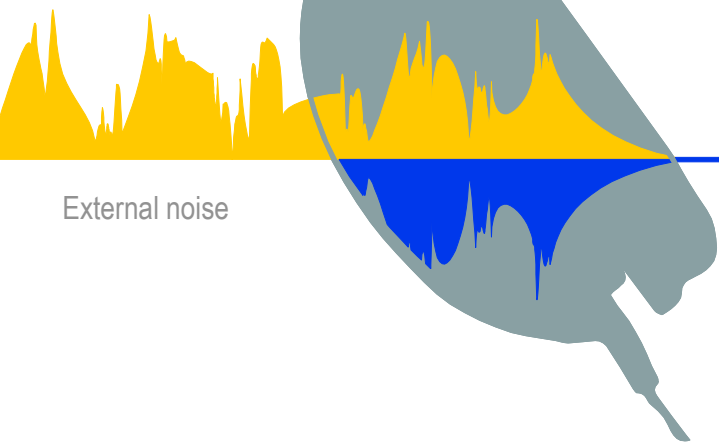


Flicker

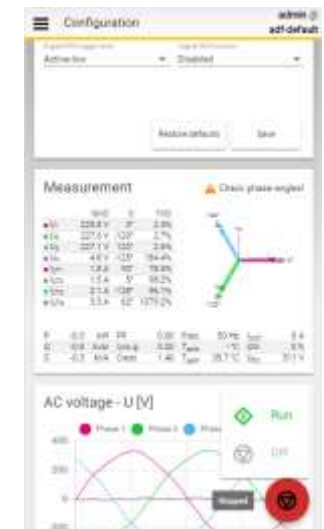


Transients  
(fast disturbances)

# ADF working principle

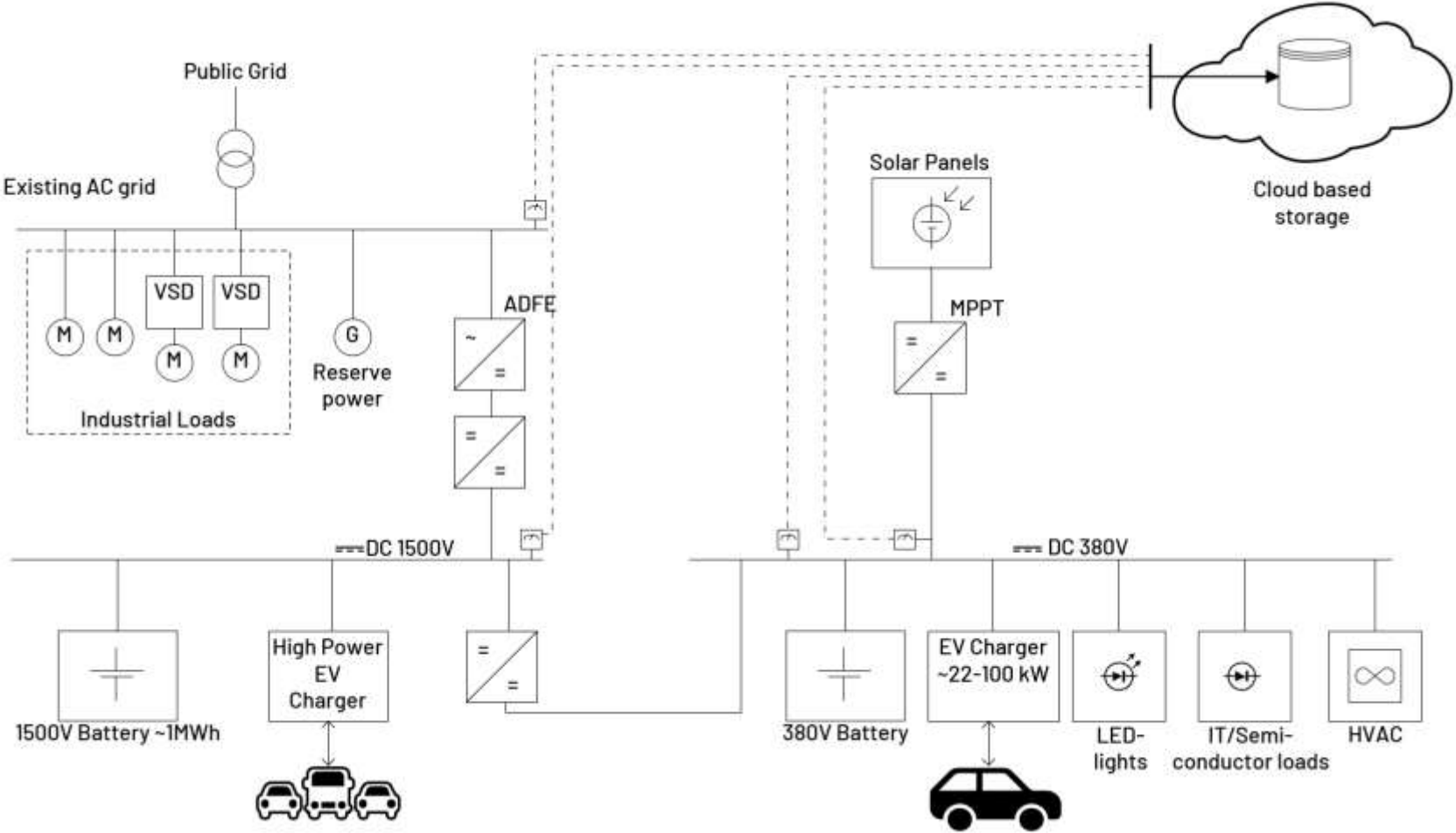


# State of the art products





# New grid, solution



# New grid, solution

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**The possible equation using standard products with 1<sup>st</sup> or 2<sup>nd</sup> life batteries**

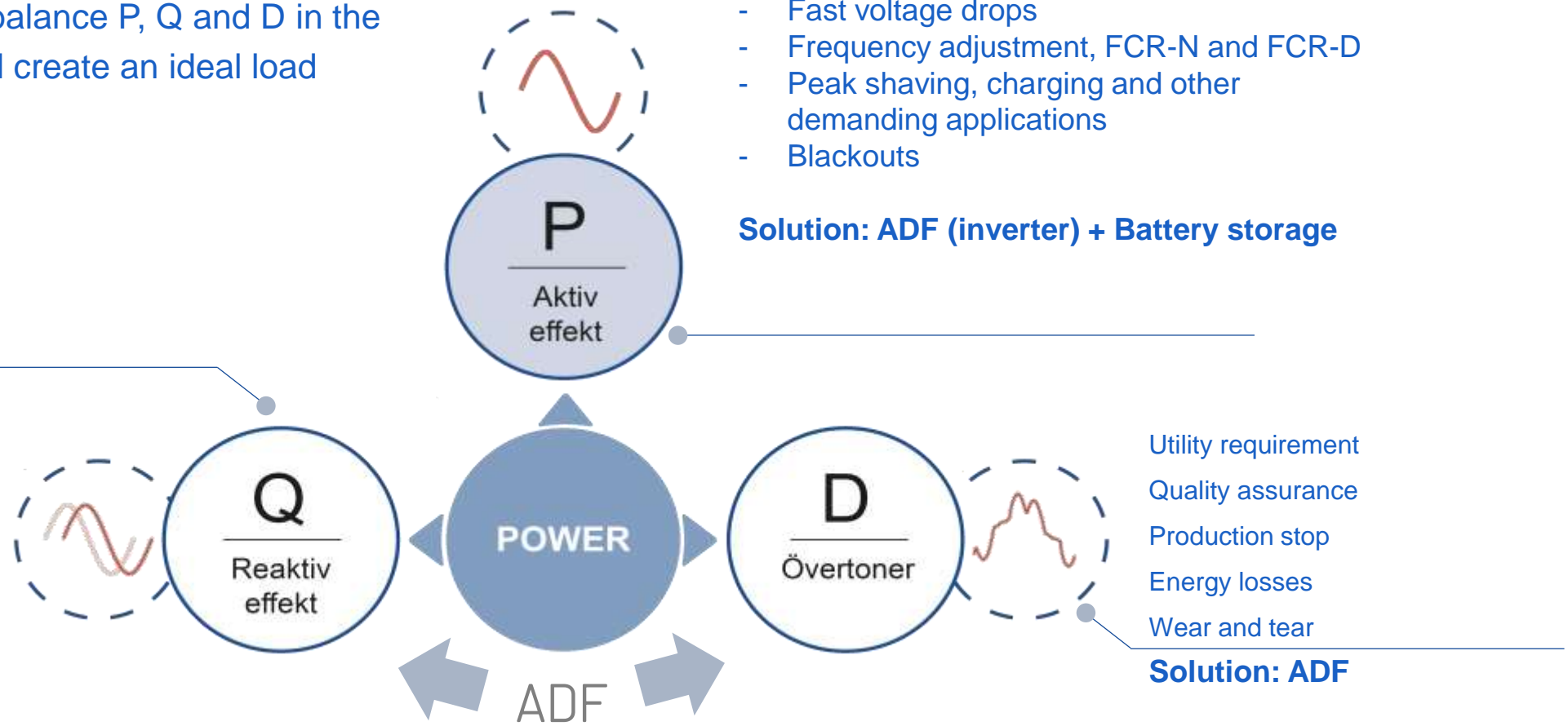
# Solution

Comsys can balance P, Q and D in the same unit and create an ideal load scenario.

- Fast voltage drops
- Frequency adjustment, FCR-N and FCR-D
- Peak shaving, charging and other demanding applications
- Blackouts

**Solution: ADF (inverter) + Battery storage**

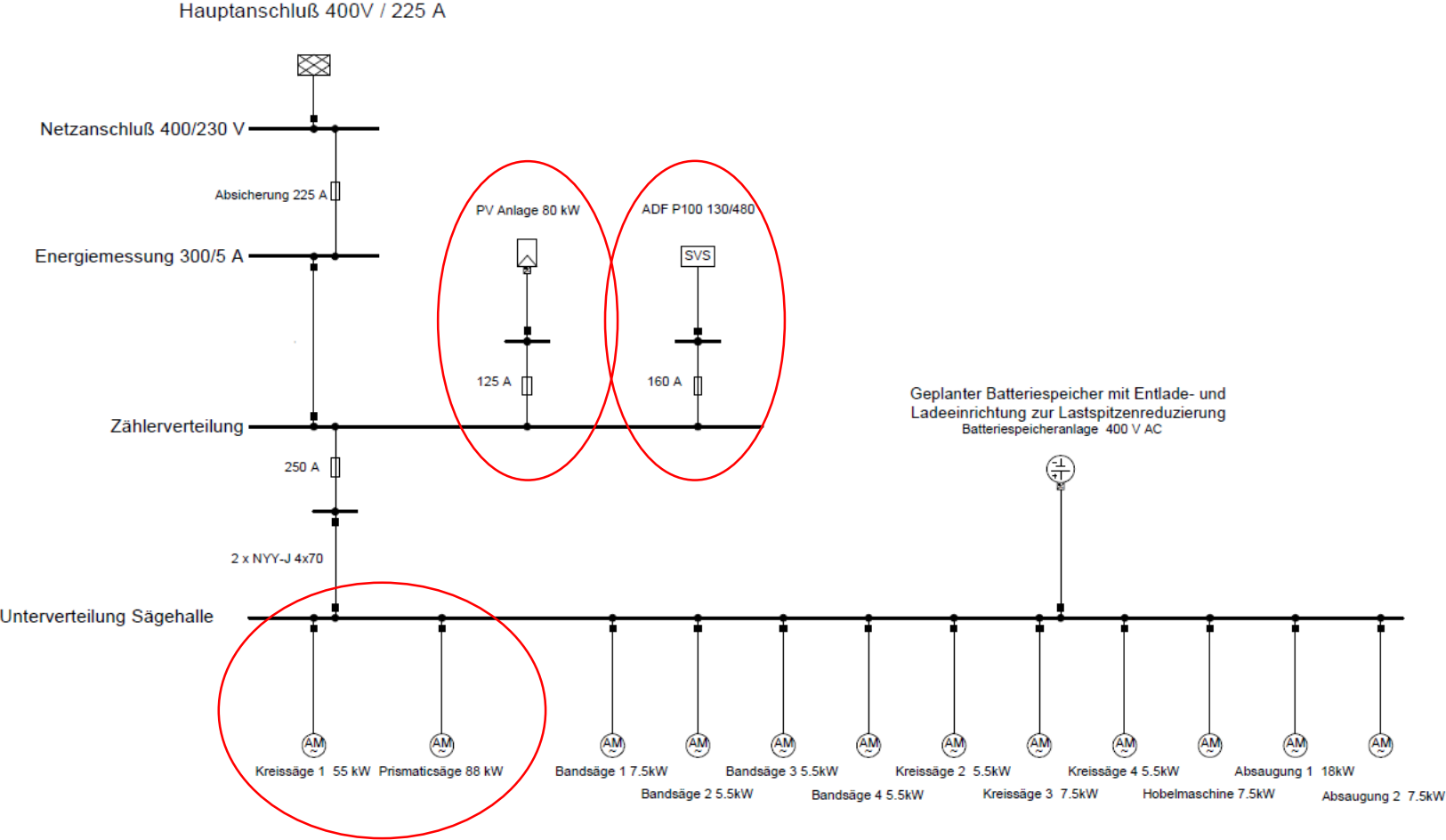
**Solution: ADF**



# Case study

## - Sawmill outside Flensburg

### Setup



# Case study

## - Sawmill outside Flensburg

Location

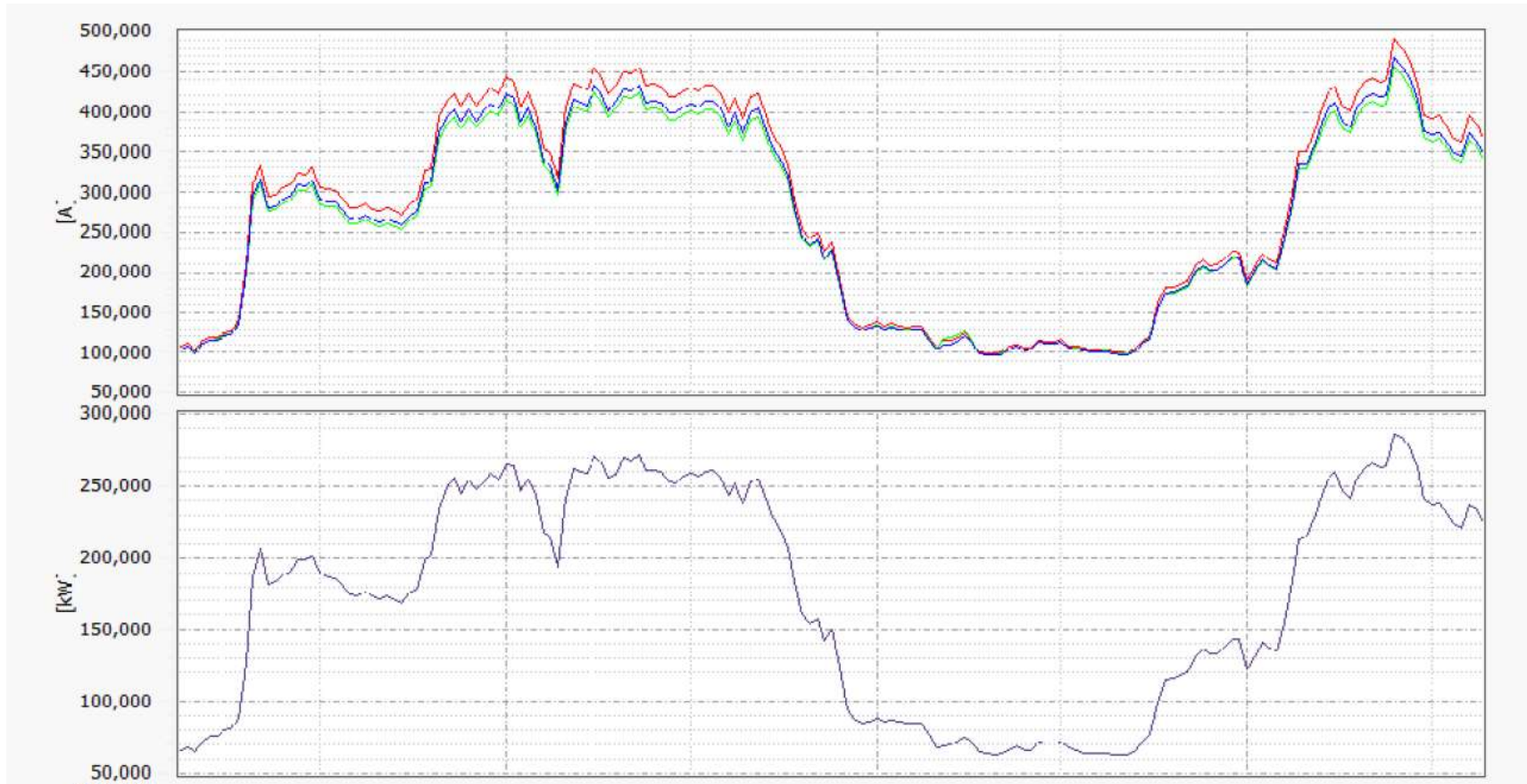




# Case study

## - Sawmill outside Flensburg

Problem



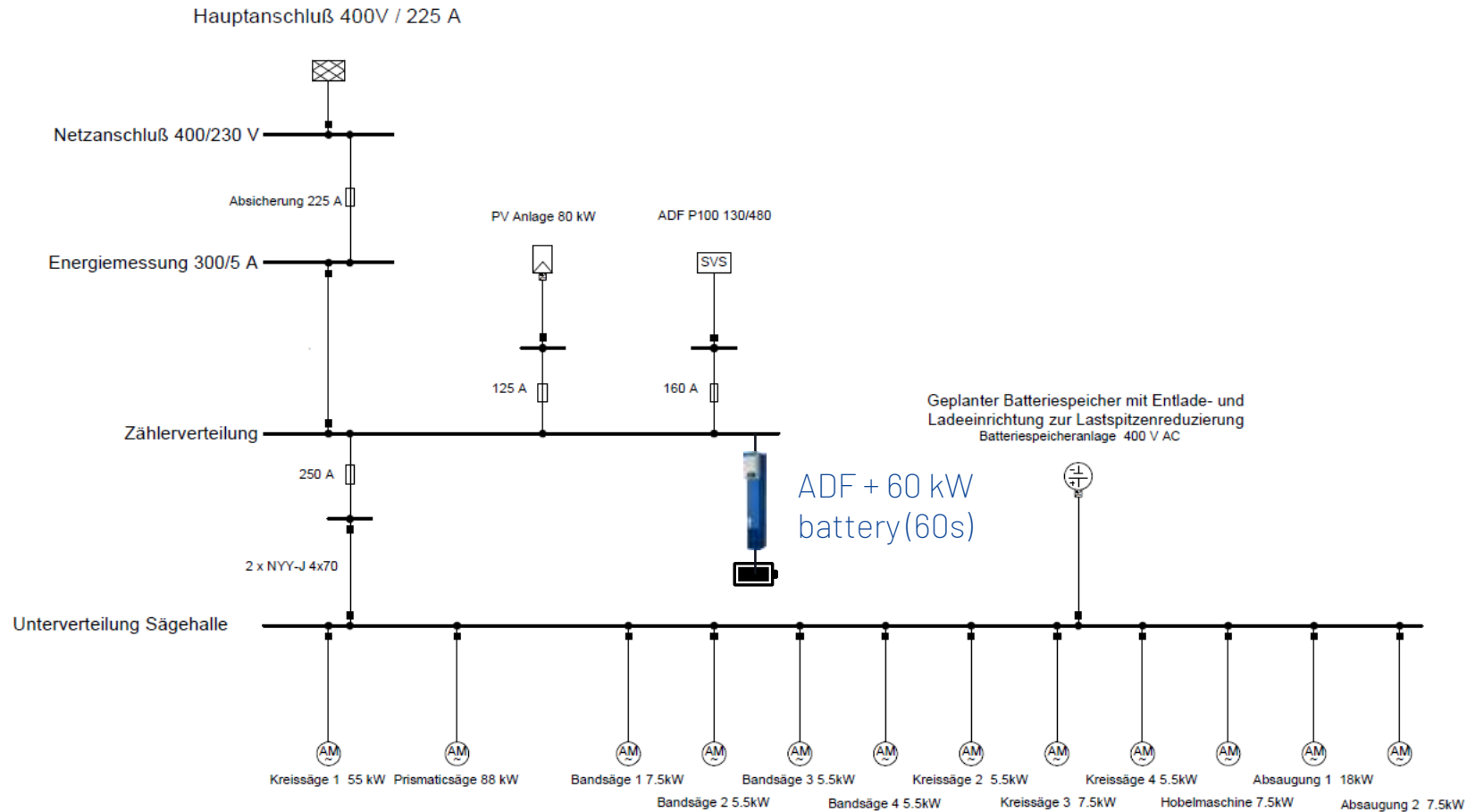
 = Kein problem

 = Nicht gut!

# Case study

## - Sawmill outside Flensburg

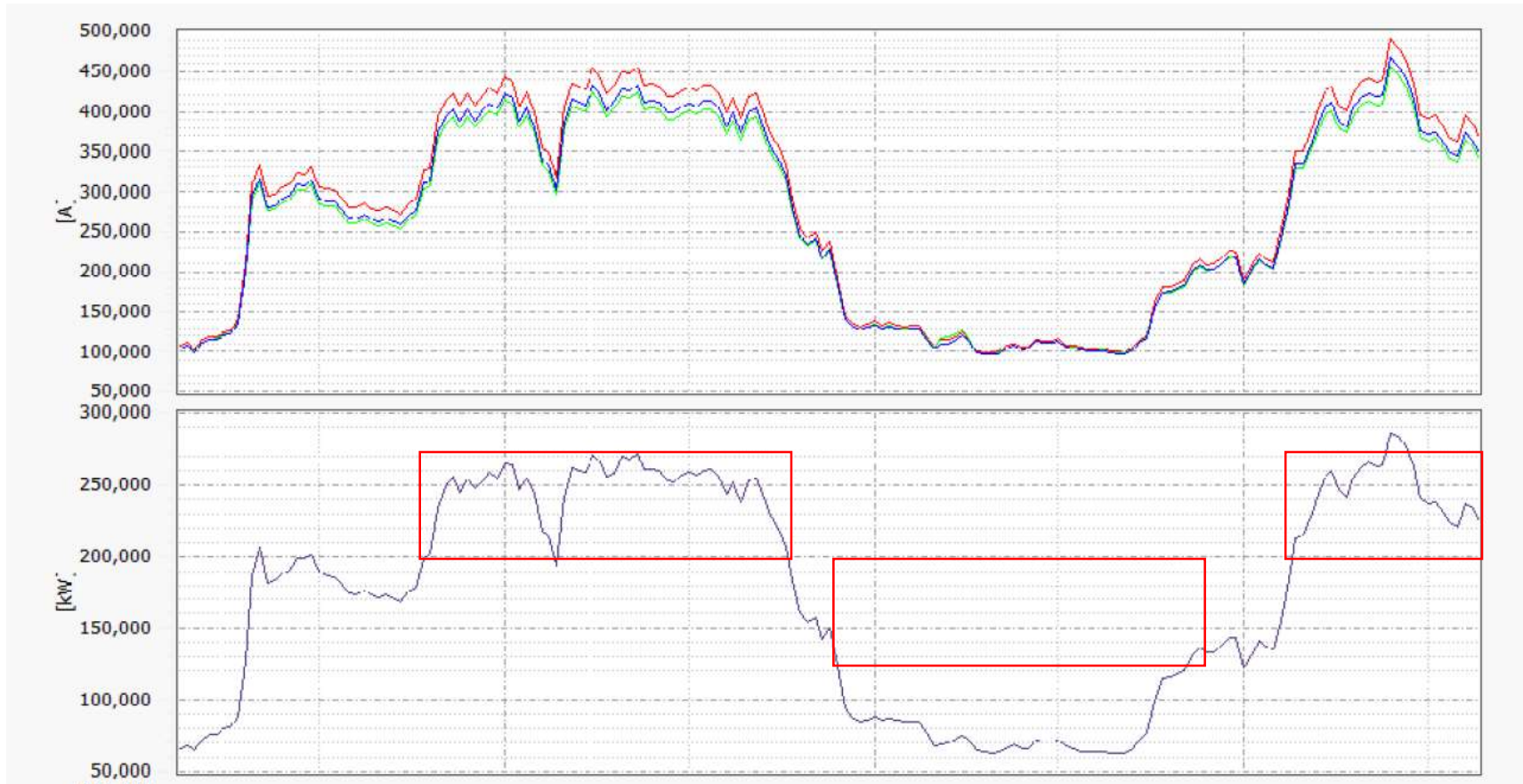
### Solution



# Case study

## - Sawmill outside Flensburg

Result



# Case study

## - Sawmill outside Flensburg

### Summary

Problem to run both main saws when PV plant is not operational

Peak demand ~260kW, available power ~200kW

One ADF P100-150/480 plus one second life battery from Vovlo buses sufficient to support customers load cycle

**Alternative solution**, new feeder from closest utility distribution, ~100k€



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