Efficient ventilation

Energy savings in pig and broiler production

Climate for Growth

introduction

- David Mulhall

- Irish dairy services IDS
- 20 Years
- Electrician by trade
- Feed Systems/ventilation systems
- Planning and layout off housing

IDS

- AGENTS

- SKOV
- BIGDUTCHMAN
- STIENEN

- Step 1

- Position off sensors in building
- Leakage off building
- Existing ventilation system
- Condition off wiring ETCI certs
- Mechanical setup off ventilation
- Position off heaters in building
- Insulation value off building

- Step 2

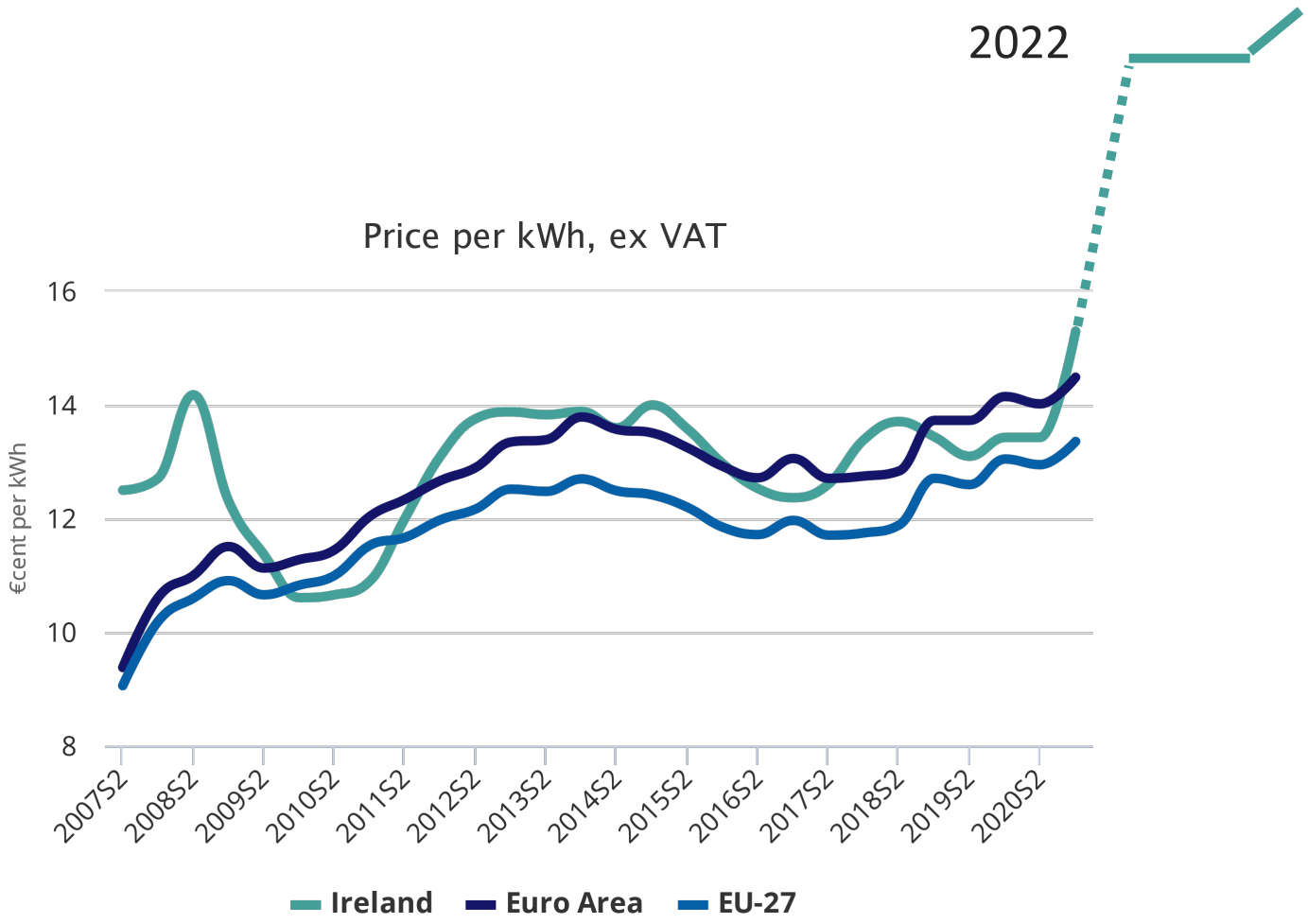
- Record amount off outlets
- Amount off inlets
- Number off animals / birds
- Age off animals/birds
- Running costs off ventilation system

- Step 3

- Work out energy savings
- Fans
- Variable speed drives
- Change setup off ventilation system
- Mechanical setup off ventilation system
- Advice on layout off building
- Commission setup (pressure/smoke)

Electricity costs

- Prices are going up



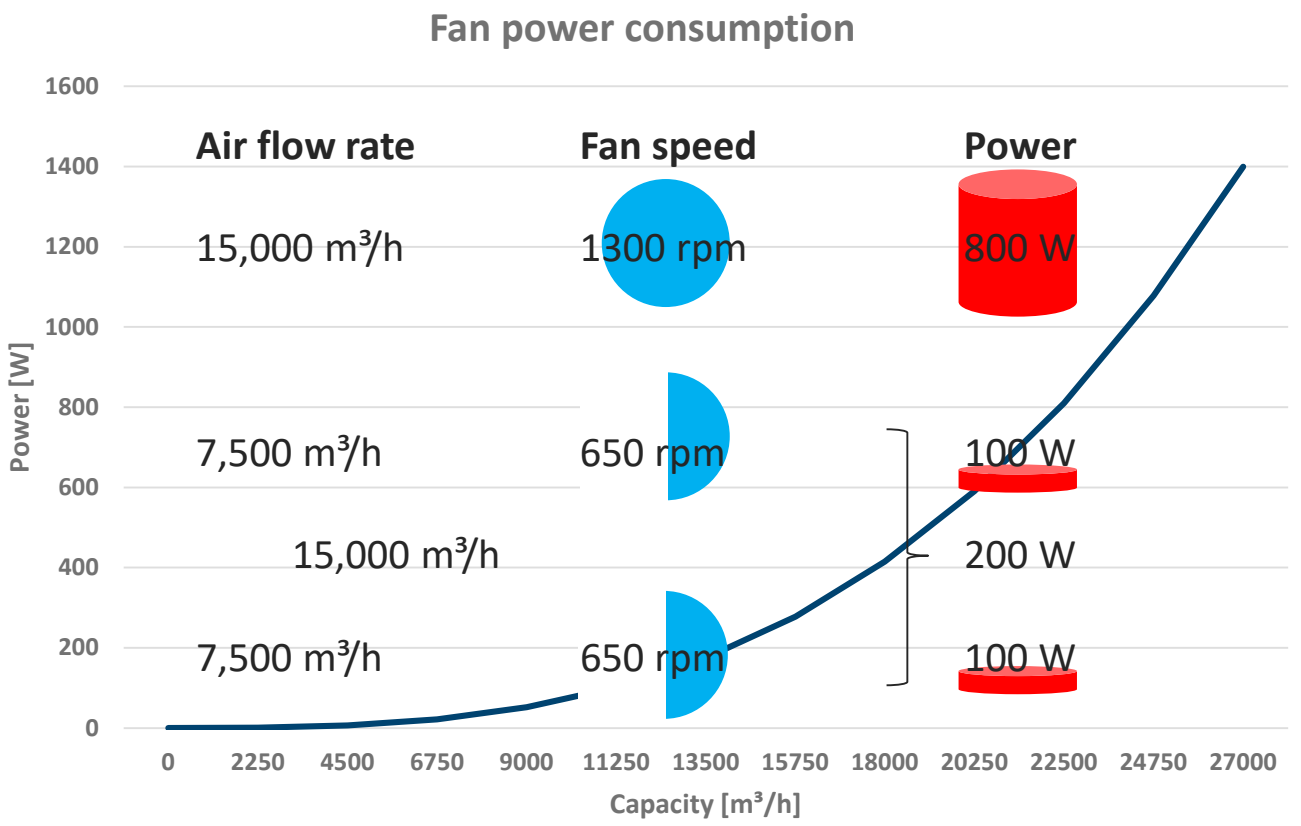
Fan power consumption

The output **q** of a fan is proportional with fan speed **n**

$$q2 = q1 \times \left(\frac{n2}{n1}\right)^1$$

The power consumption **p** of a fan is cubic of the fan speed **n**

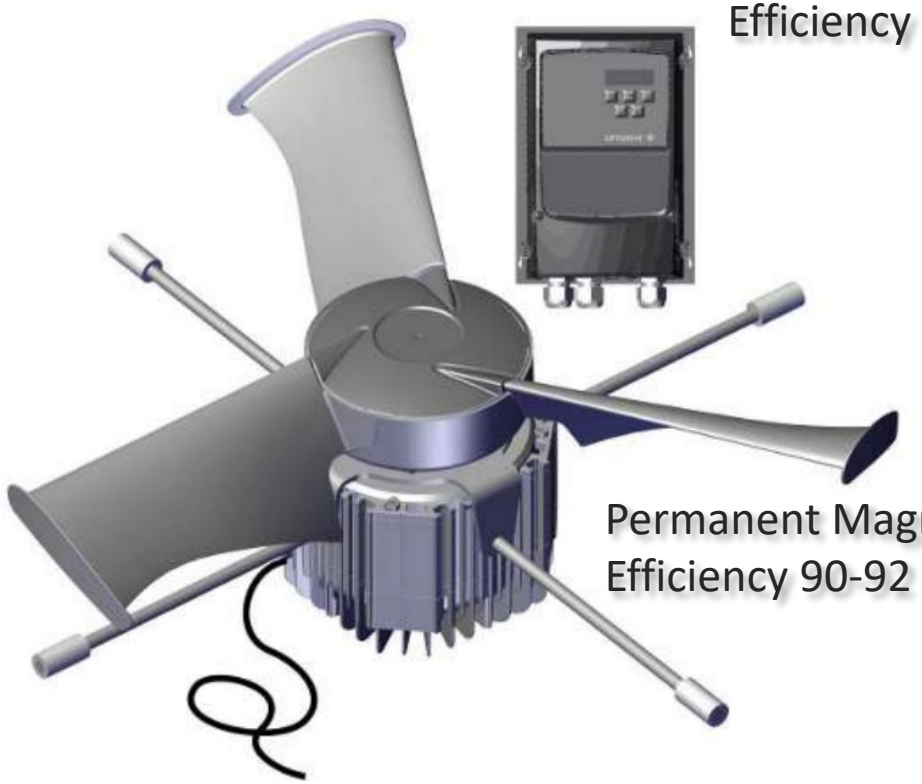
$$p2 = p1 \times \left(\frac{n2}{n1}\right)^3$$



Use of LPC fans

Low Power Consumption (LPC) fans

Energy efficient motors and power converters



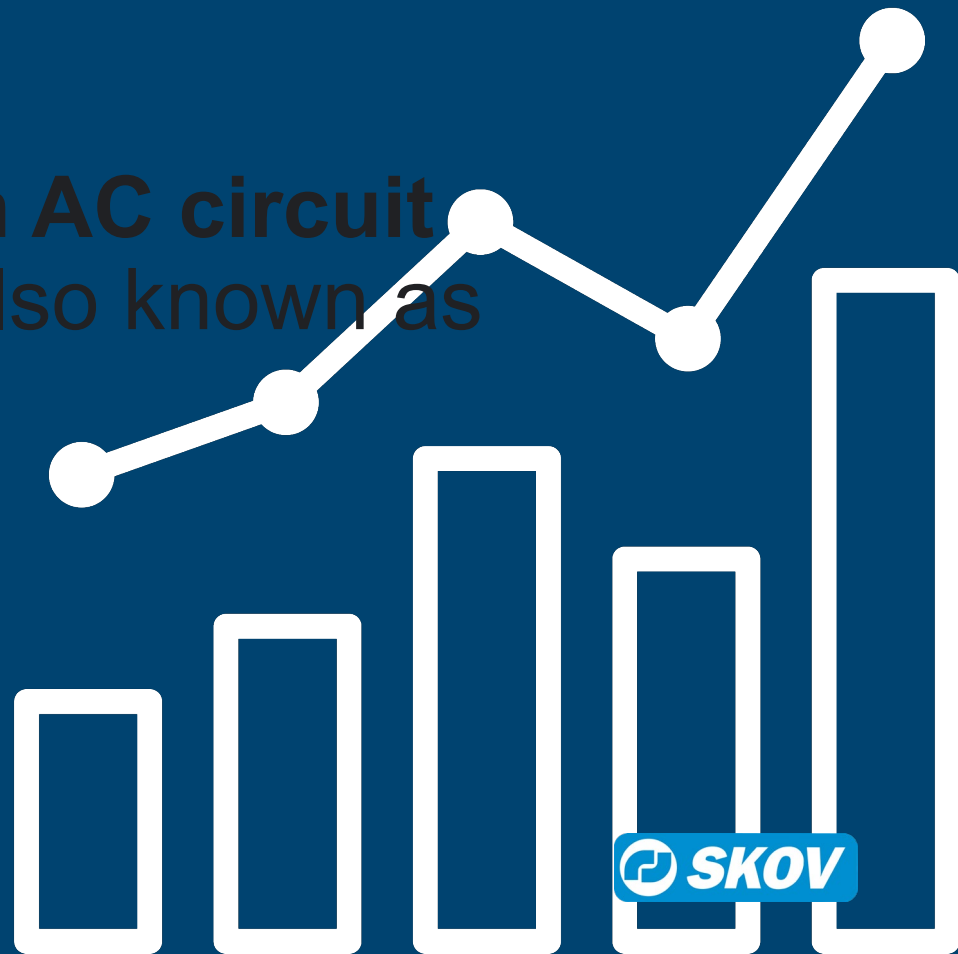
- 2 big benefits off LPC fans

- Low energy
- Low decibel (dBA) noise

Standard fans

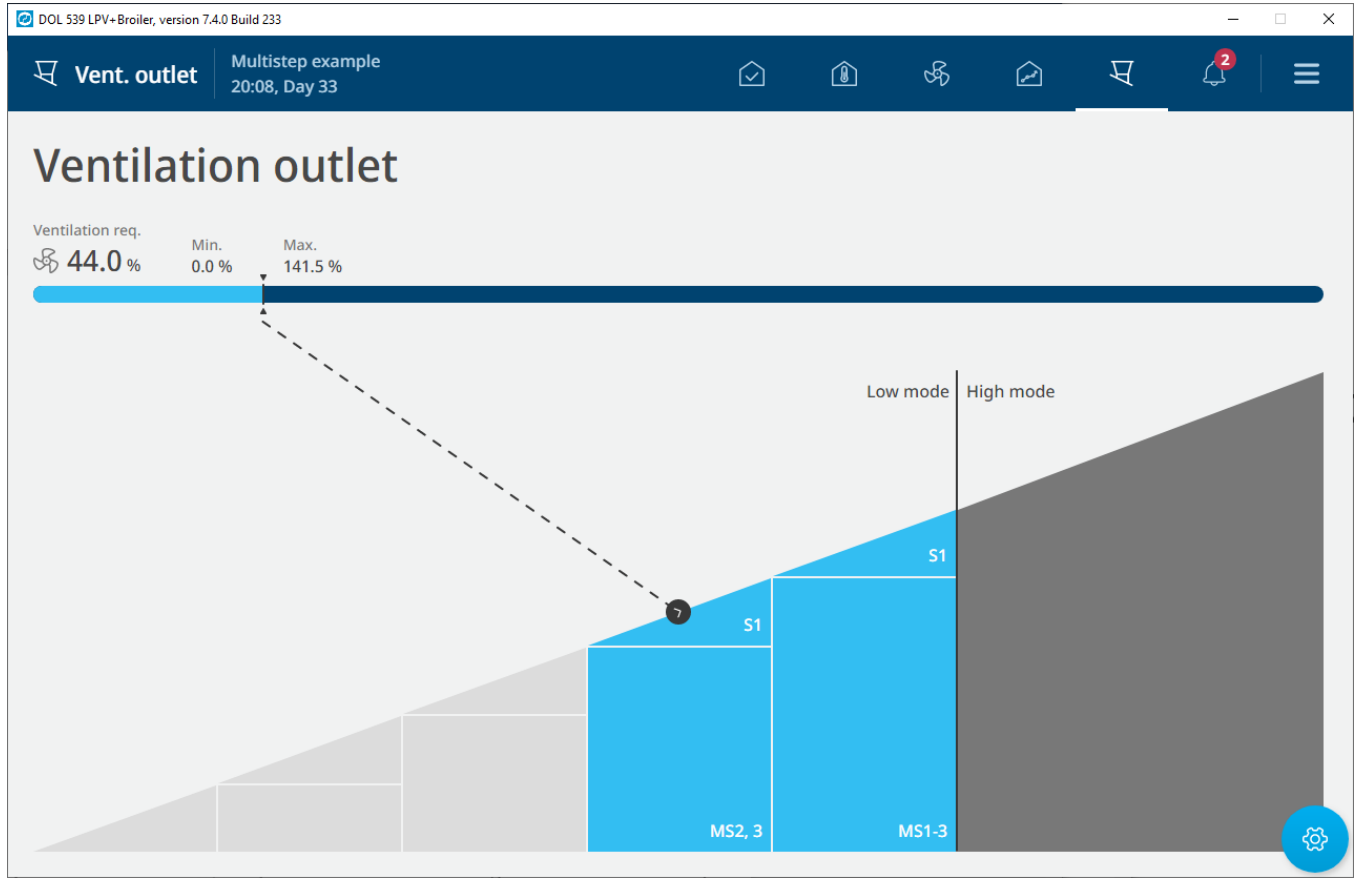
What is Wattless energy?

Wattless Power is **the Power in an AC circuit which cannot perform work**. ... Also known as Reactive Power, Idle Power.



Dynamic MultiStep

High efficiency fans run at low mode as much as possible



Locations

Broiler on floor example

Location is Co. Monaghan Ireland

Dimensions 120 x 20 meter

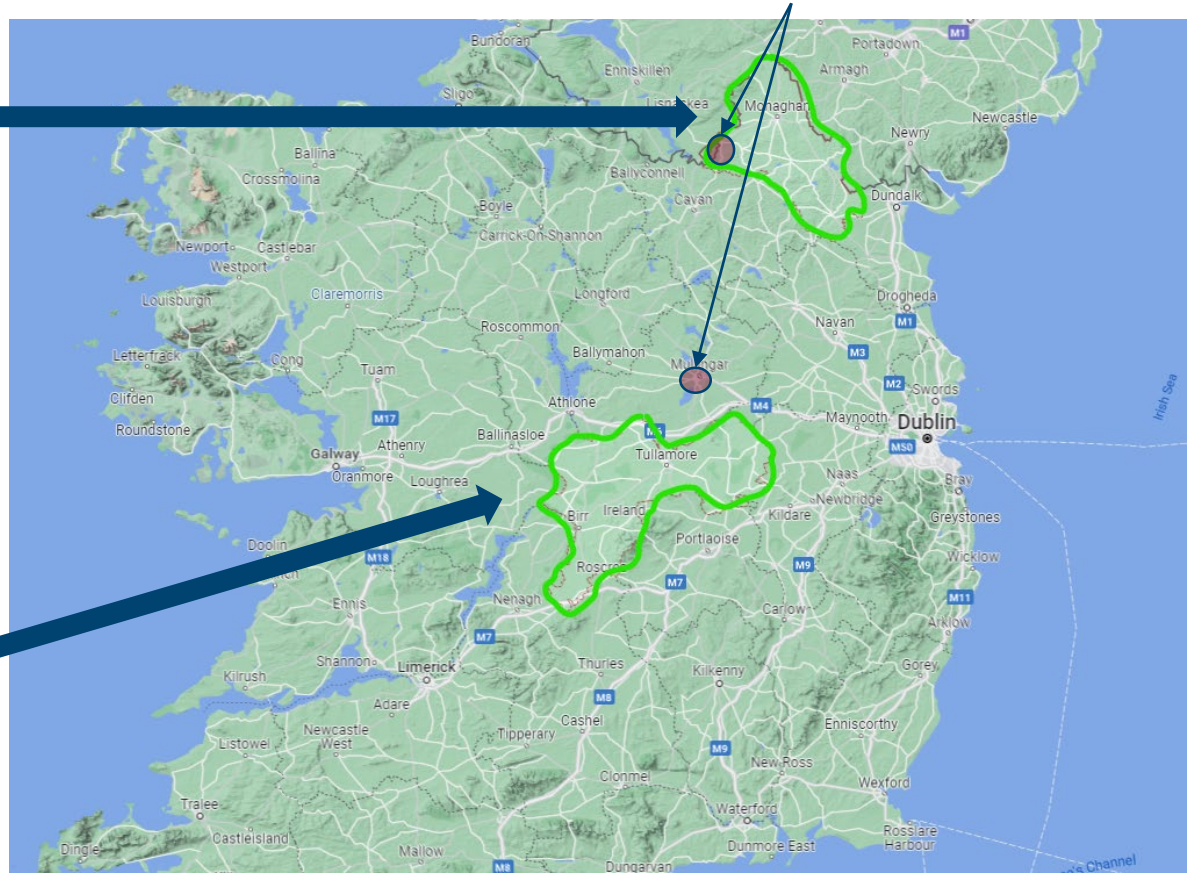
50.000 broiler in the house, approx. 2.0 kg slaughter weight

Finisher pig example

Location is Co Offaly Ireland

1200 pigs, finisher 30-120 kg

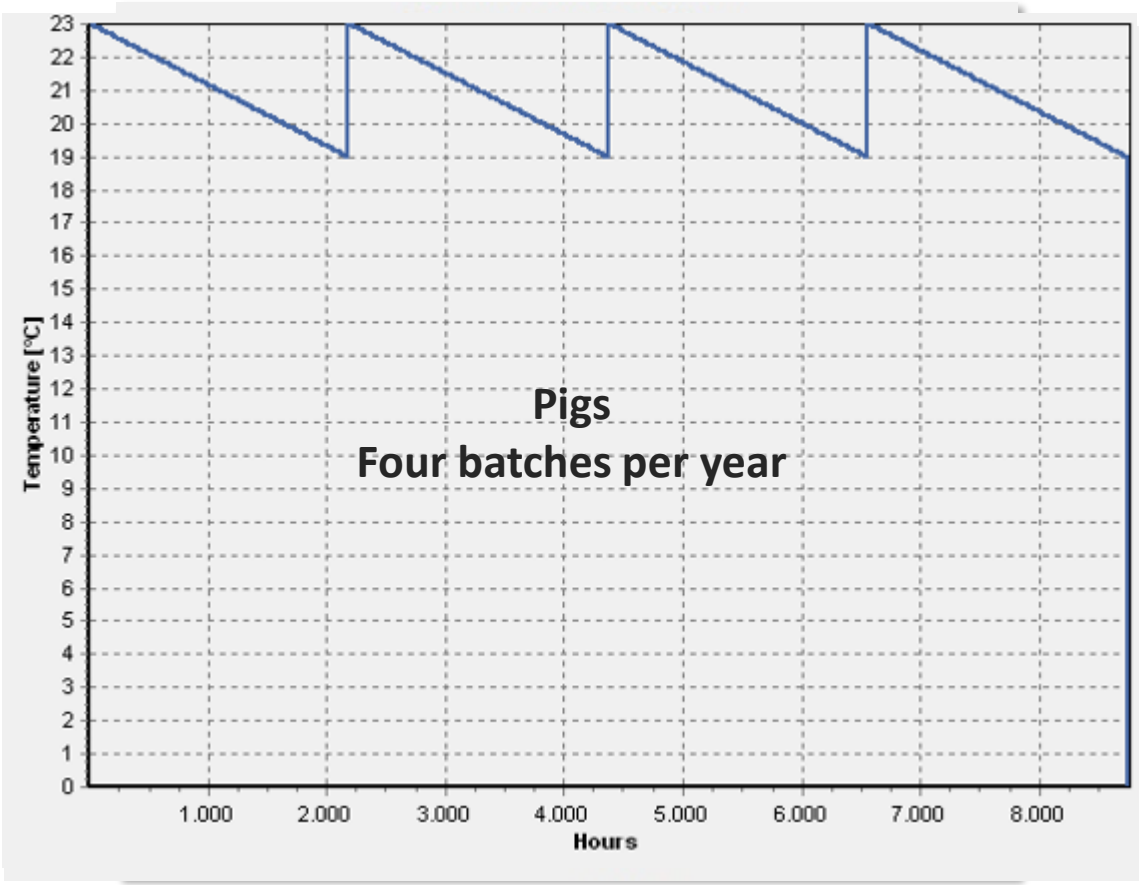
Climate data from Meteonorm locations



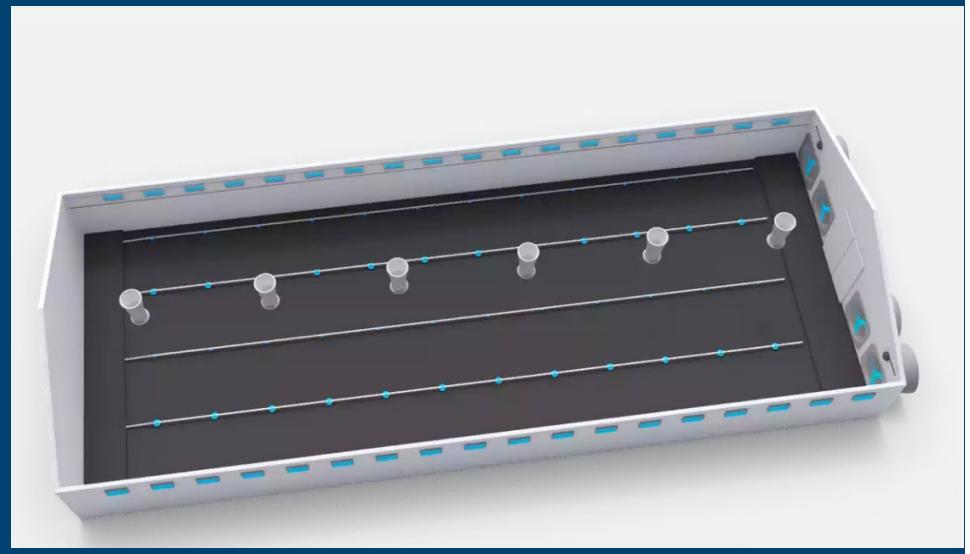
The calculations

Inputs

- Climate data
  (full year, hourly values)
- Animal data
  (batch data over full year)



Broiler shed



Ventilation before

MultiStep with

11 x DA 600-7 chimneys

4 DB 1400 gable fans

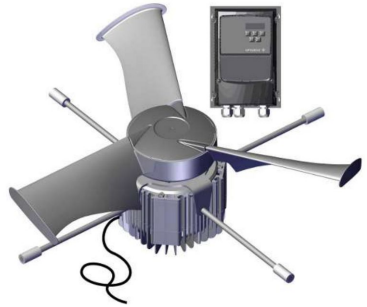
All fans with AC motor

Ventilation after

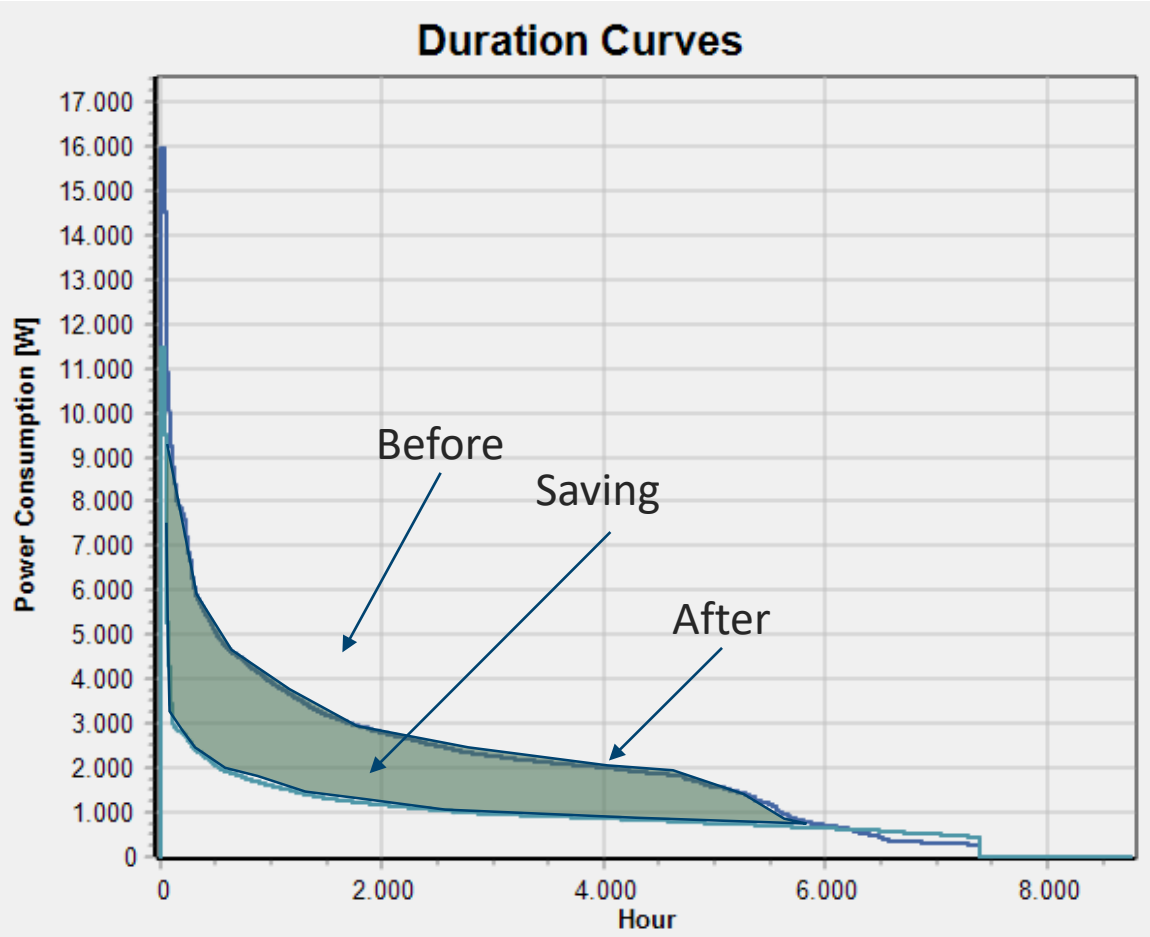
Dynamic MultiStep with

8 x DA 820-10 LPC chimneys

3 x BF 50 HF LPC gable fans



Broiler shed energy saving potential



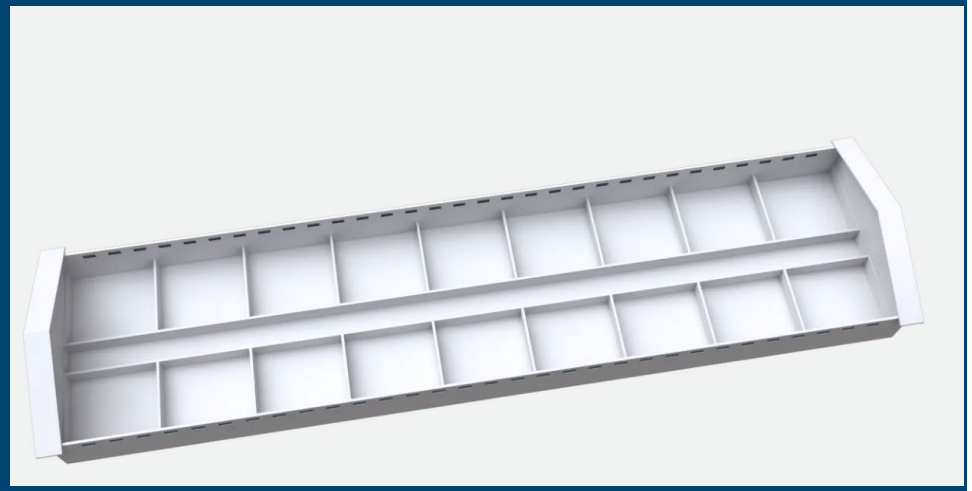
Electric power for ventilation

Before: 17.600 kWh per year

After: 8.300 kWh per year

With 38 Euro cent per kWh, saving is 3.534 Euro per year

Pig house



Ventilation before

MultiStep with

9 x ECT 632 chimneys

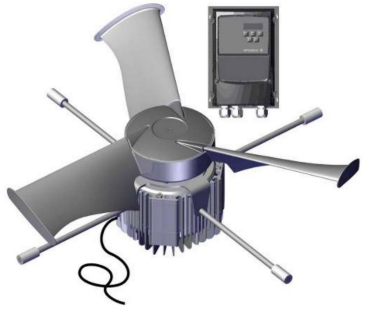
All fans with AC motor

Ventilation after

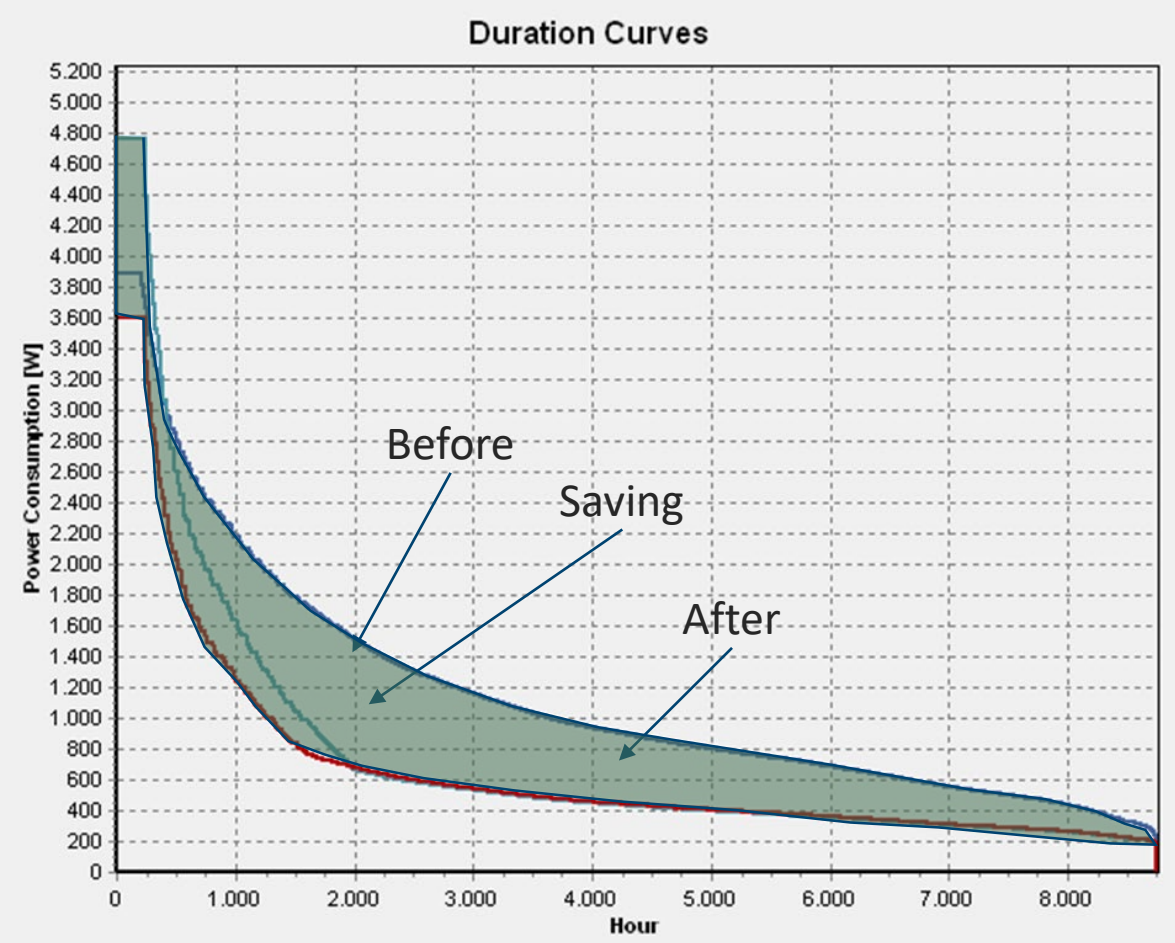
Dynamic MultiStep with

7 x DA 600 LPC 13 chimneys or

8 x DA 600 LPC 11 chimneys



Pig house energy saving potential



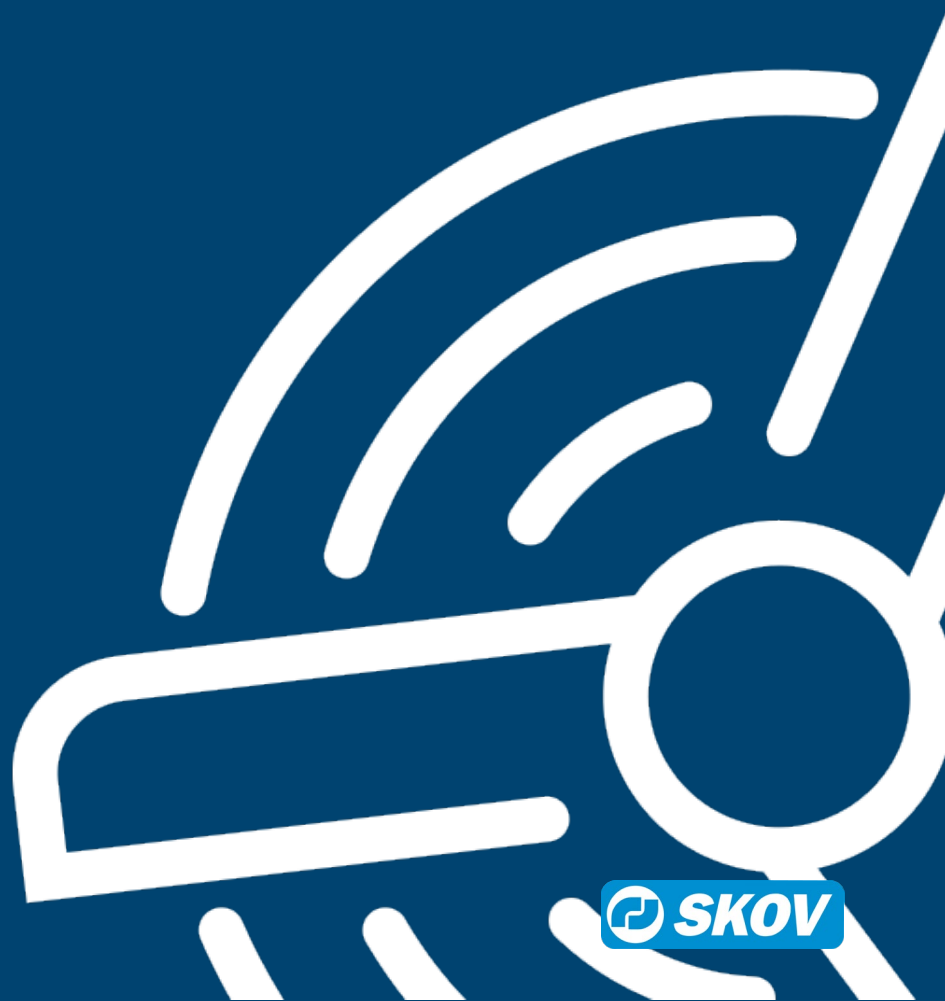
Electric power for ventilation

Before: 10.100 kWh per year

After: 6.800 kWh per year or
5.900 kWh per year

With 38 Euro cent per kWh, saving is 1.596 Euro per year

Questions?



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