



# Energy Management

Culture for saving energy



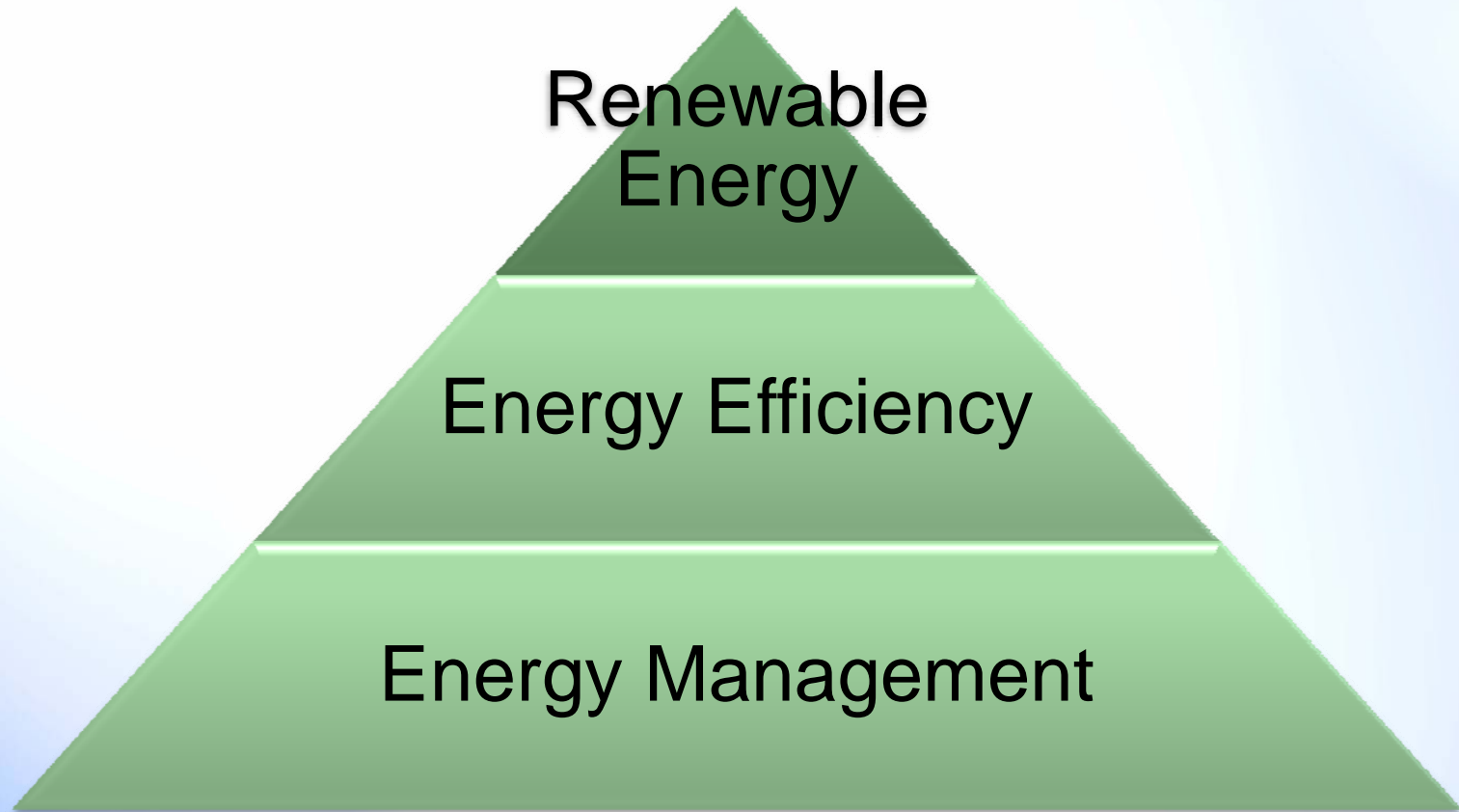


# Why is energy use important?

- Energy is a source of greenhouse gas emissions
- EU Regulations heavily target industrial energy users
- Most Importantly!
  - Energy is a cost to your business
  - Increase competitiveness in the market
  - You can't control what you don't understand



# Energy Pyramid



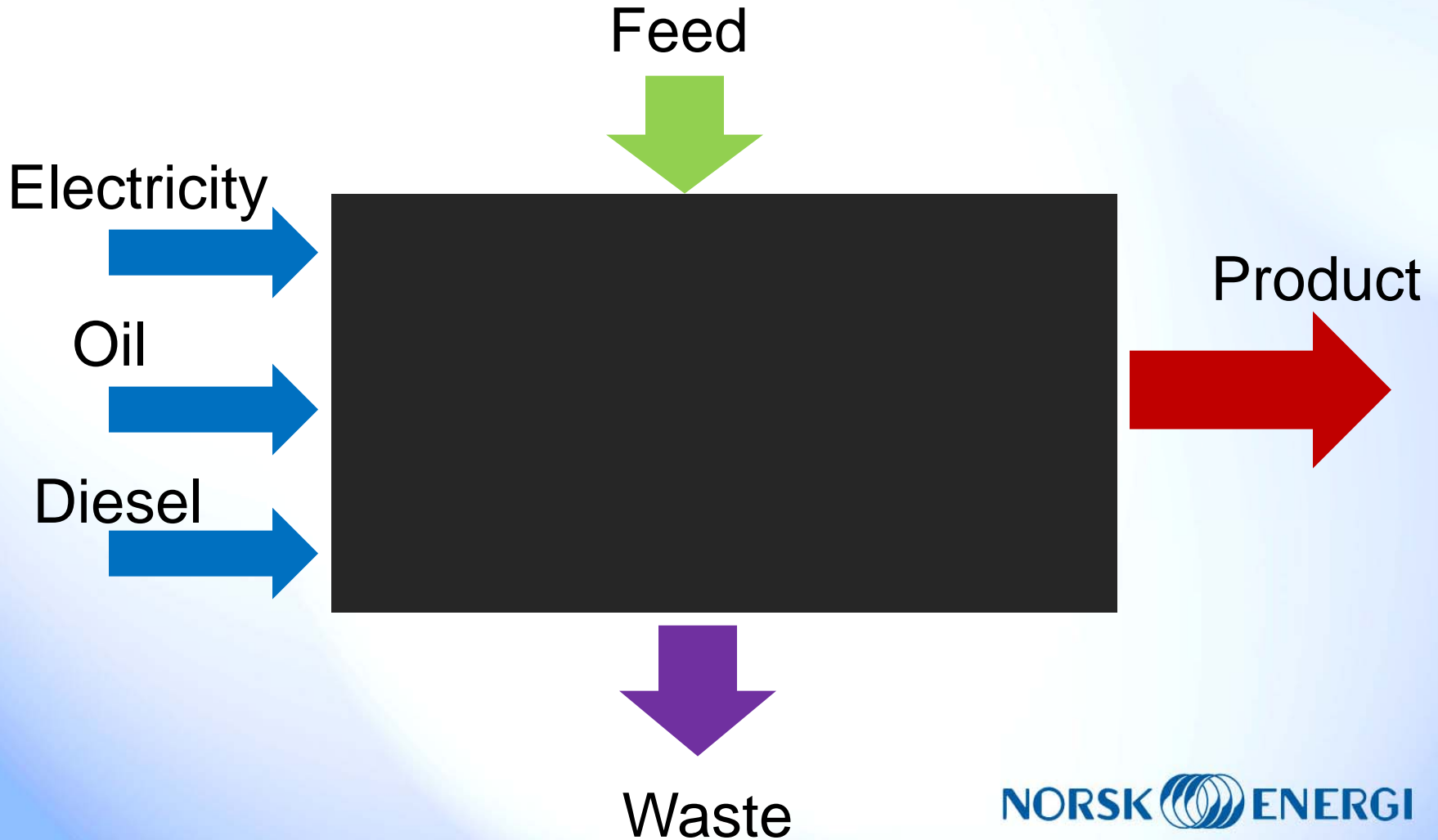


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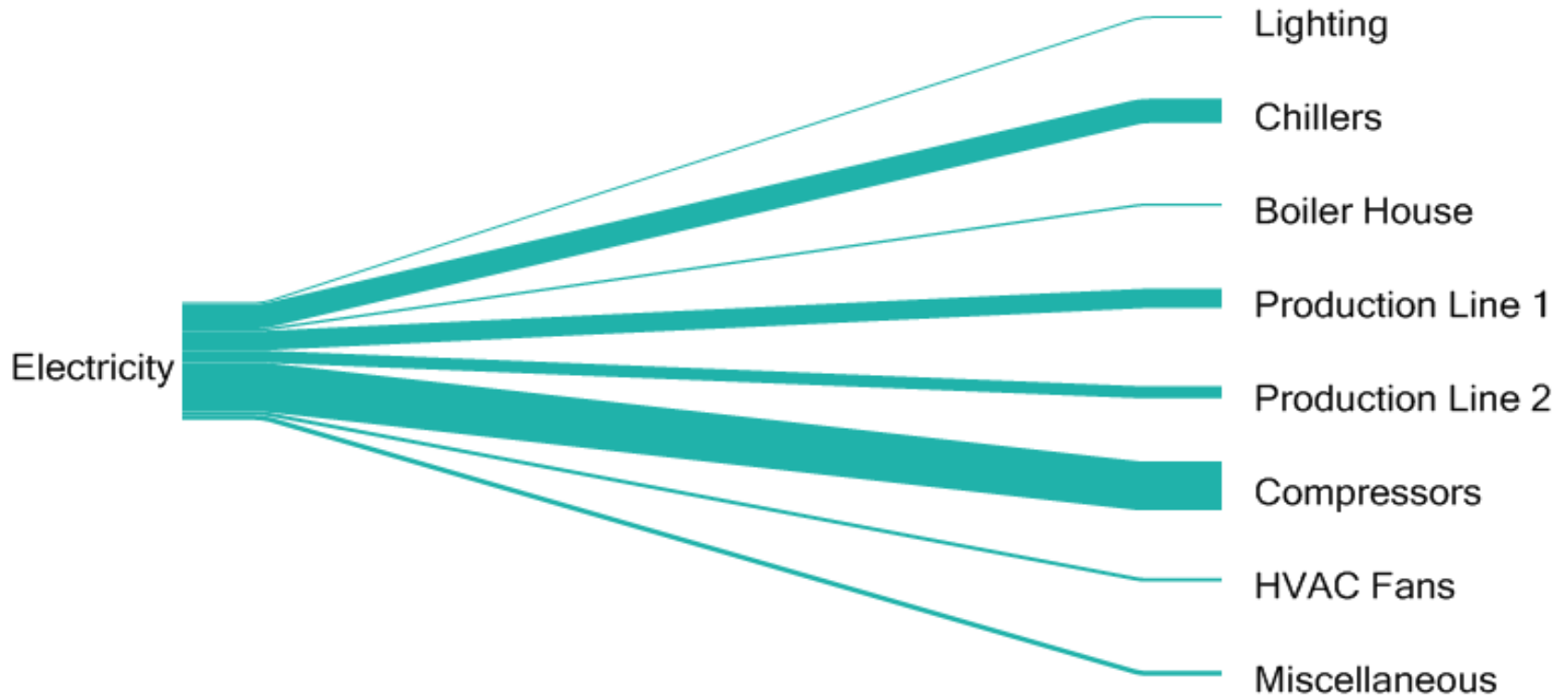


# Mapping Energy in your plant





# Mapping Energy in your plant





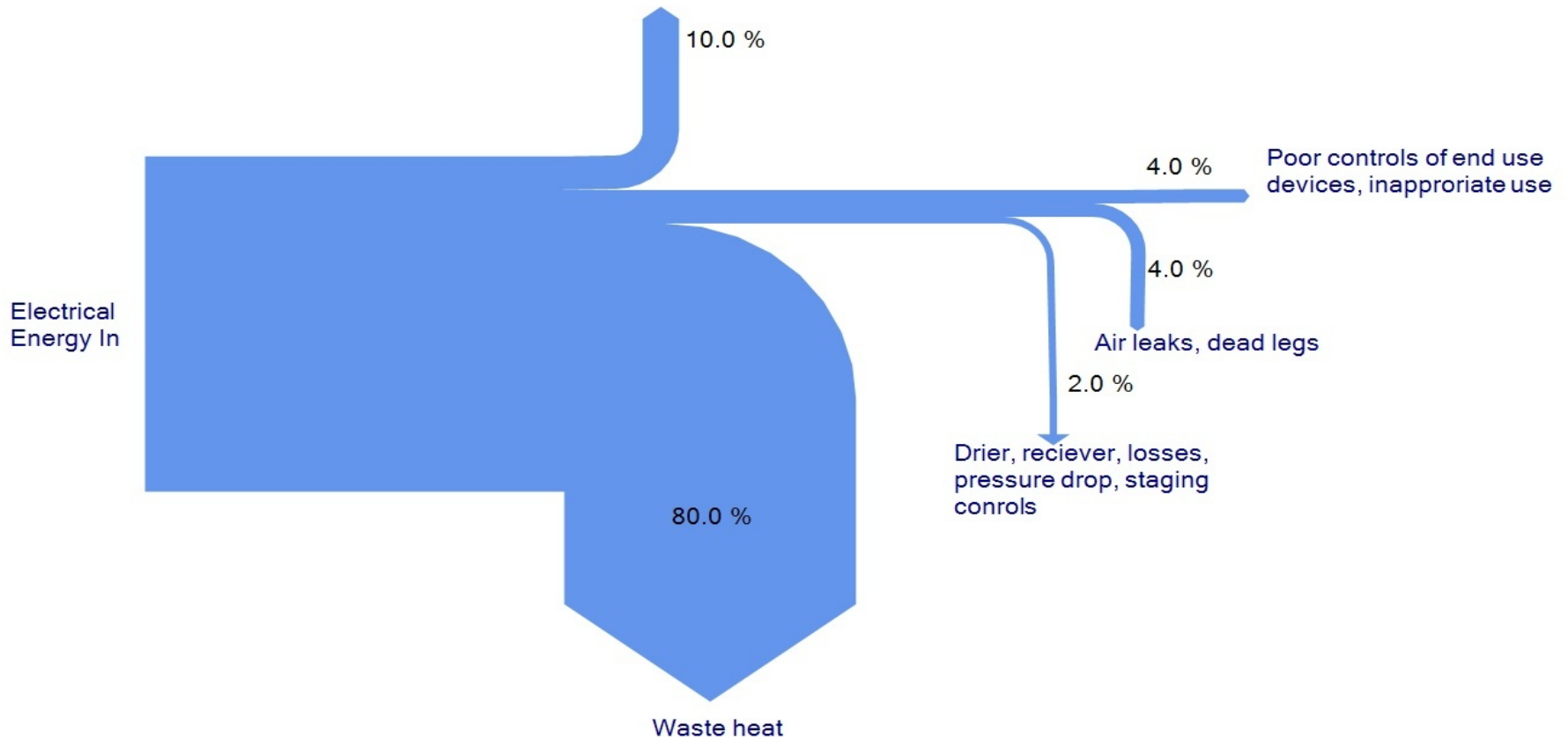
# Secondary Energy

- Secondary energy is the energy source produced from a purchased energy source, such as:
  - Compressed air
  - Steam
  - Hot water
  - Chilled water
- Production and use of secondary energy should also be understood and mapped
- Each energy conversion has its own production efficiency



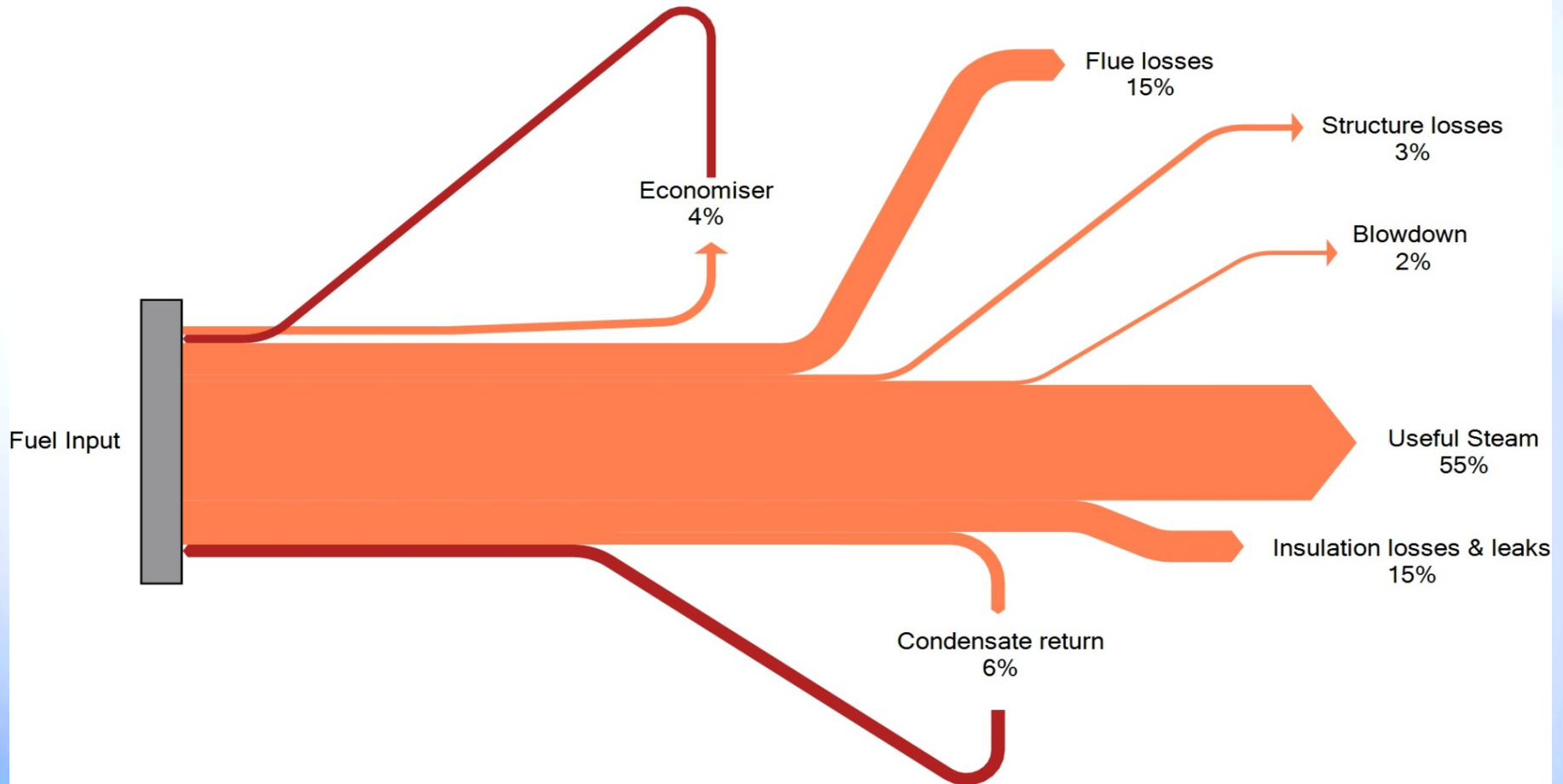
# Secondary Energy – Compressed Air

Effective energy utilisation

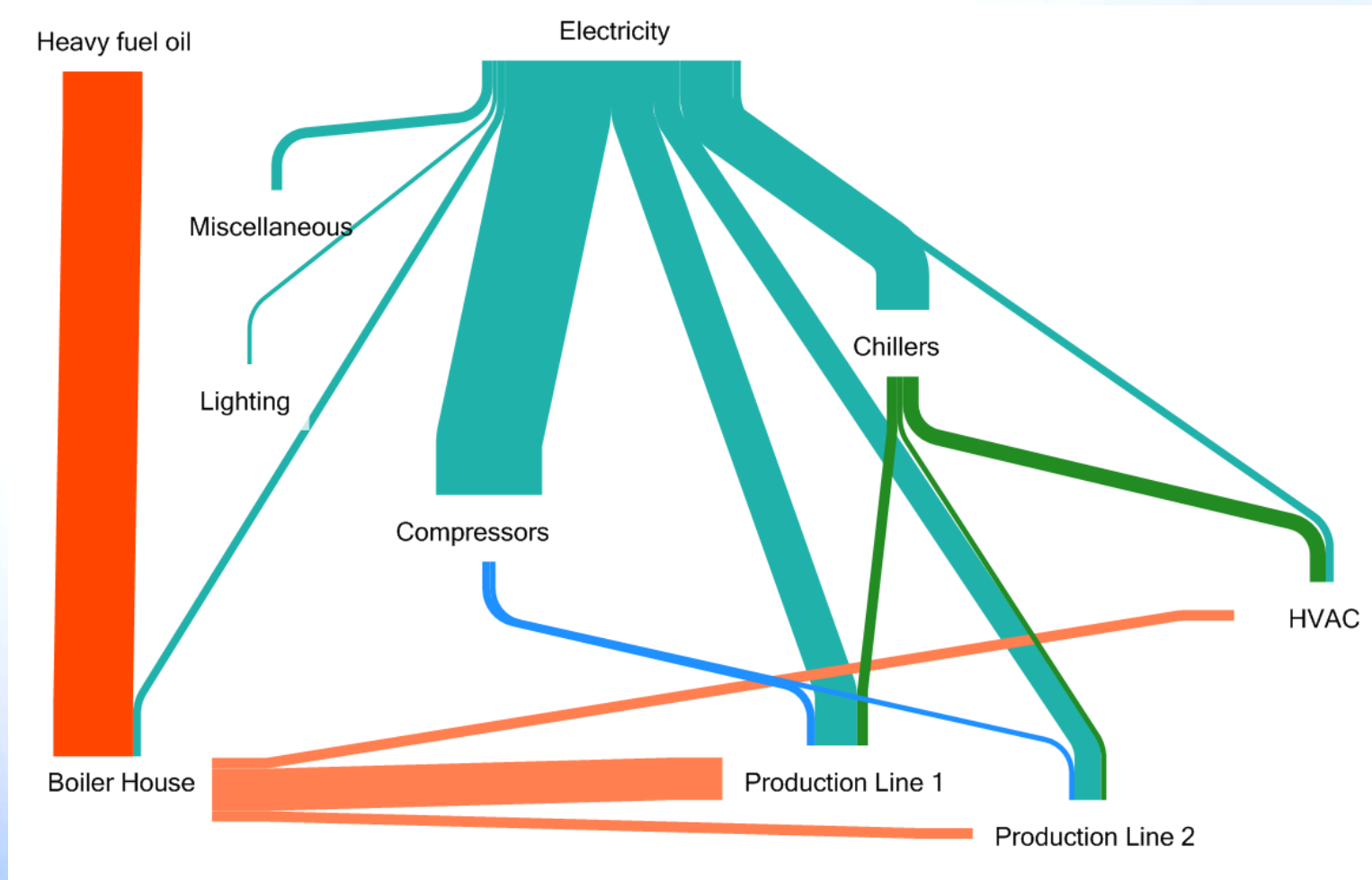




# Secondary Energy – Boiler system



# Mapping Energy in your plant





# Energy Mapping

## Benefits:

- Understanding energy use in each area of your process allows you to benchmark your performance
- Understanding primary and secondary energy use can help in identifying energy waste or inappropriate use



# Metering & Monitoring

- Metering is used to understand how much energy is **actually** being used by process.
  - Is your understanding correct?
  - Is there something happening
- Monitoring the information enables you to identify anomalies, check



# Maintenance

- Preventative maintenance: Maintaining equipment to ensure equipment remains operating
- Energy efficient maintenance: Maintaining equipment to ensure equipment is operating **efficiently**



# Maintenance

## Electric motors

- Dust accumulation on electric motors reduces the heat transfer from the cooling fins, causing the motor to run warmer – loss in efficiency

## Electricity supply quality

- Unbalanced phase loading in the plant reduces the efficiency of 3-phase motors.
- Harmonics in the supply can cause loss of efficiency in plant equipment



# Waste minimisation

- Identification of inappropriate energy use, such as using compressed air for cleaning
- Identifying areas where energy is wasted, such as compressed air or steam leaks, poor insulation on chilled water or steam lines etc.



# Production planning

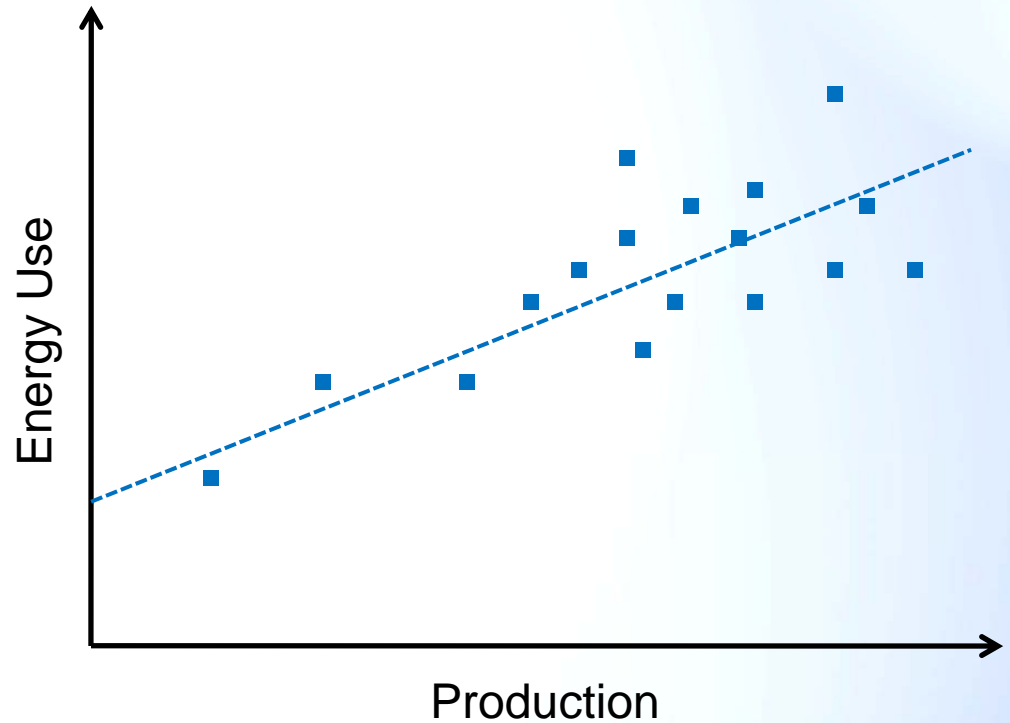
- Operating at full production optimised energy efficiency
  - Can the production schedule be altered to maximise process efficiency?
  - Elimination of process bottle-necks





# Energy Index

- Relation between production and energy use
- Variations due to such reasons as seasonal changes

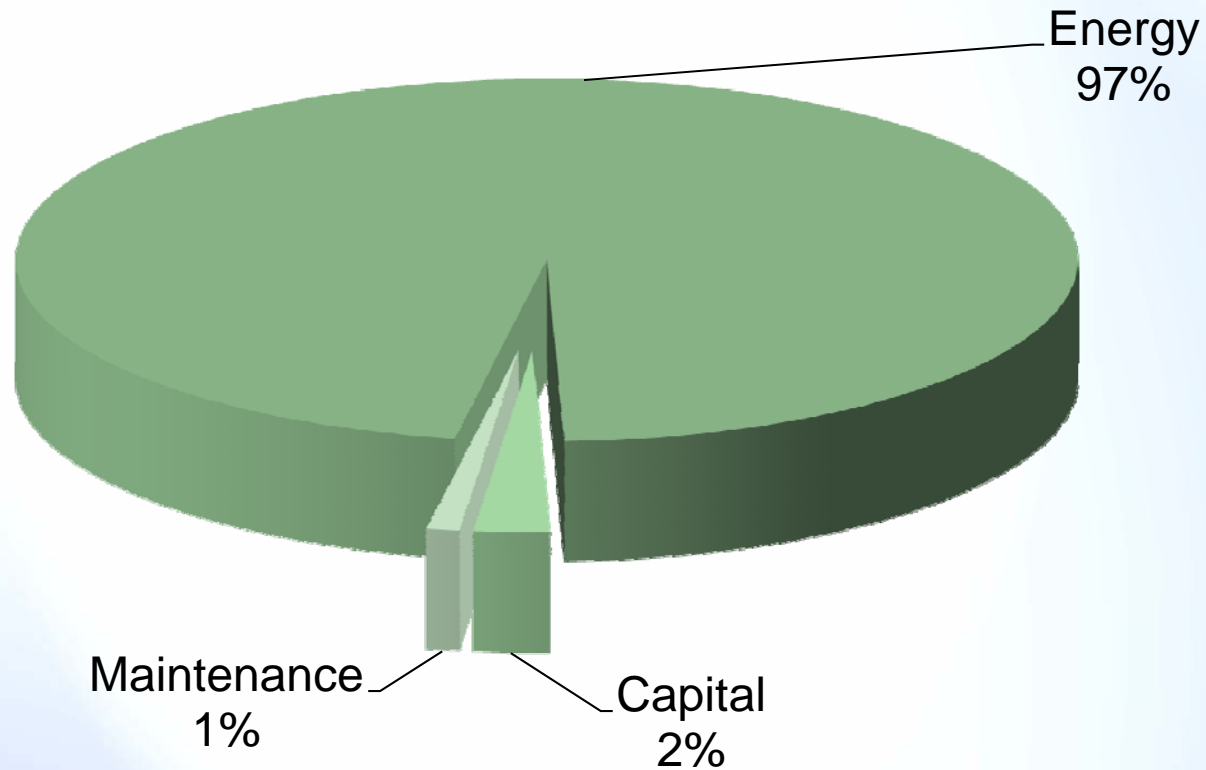




# Purchasing of equipment

- Total cost of ownership should also be considered when purchasing new equipment
- Implementing a procurement policy for the purchase of energy efficient equipment is cheap

# Life cost of an 11kW electric motor



Based on 4 000 hours of operation, initial purchase cost of €7000 and an electricity cost of €0,05 per kWh



# Energy Management Culture

- Company intent on saving energy needs to be clear to employees
- Energy Champions can be assigned who are responsible for energy use in a certain area
- Talking about energy use
  - Leadership meetings
  - Toolbox talks



# Energy Management Culture

- Example of activities:
  - Changing of lighting systems to more energy efficient option
  - Installing solar hot water for domestic hot water
  - Energy saving signage and general awareness campaign



**Thank you for your attention**