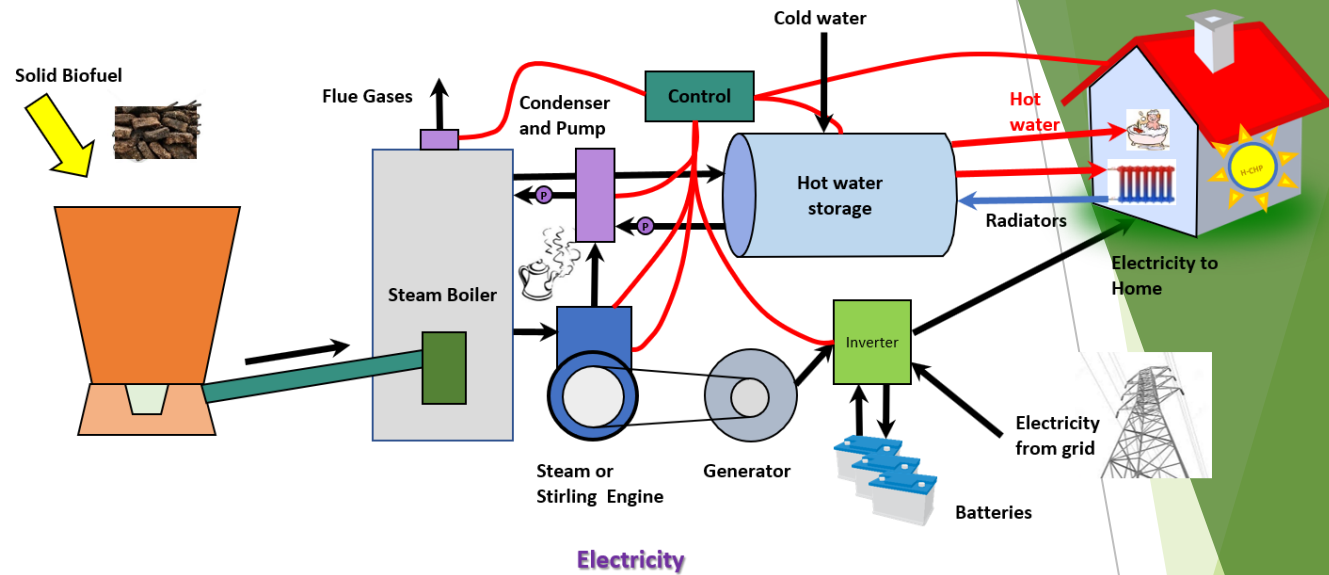


Combined Heat and Power (CHP)



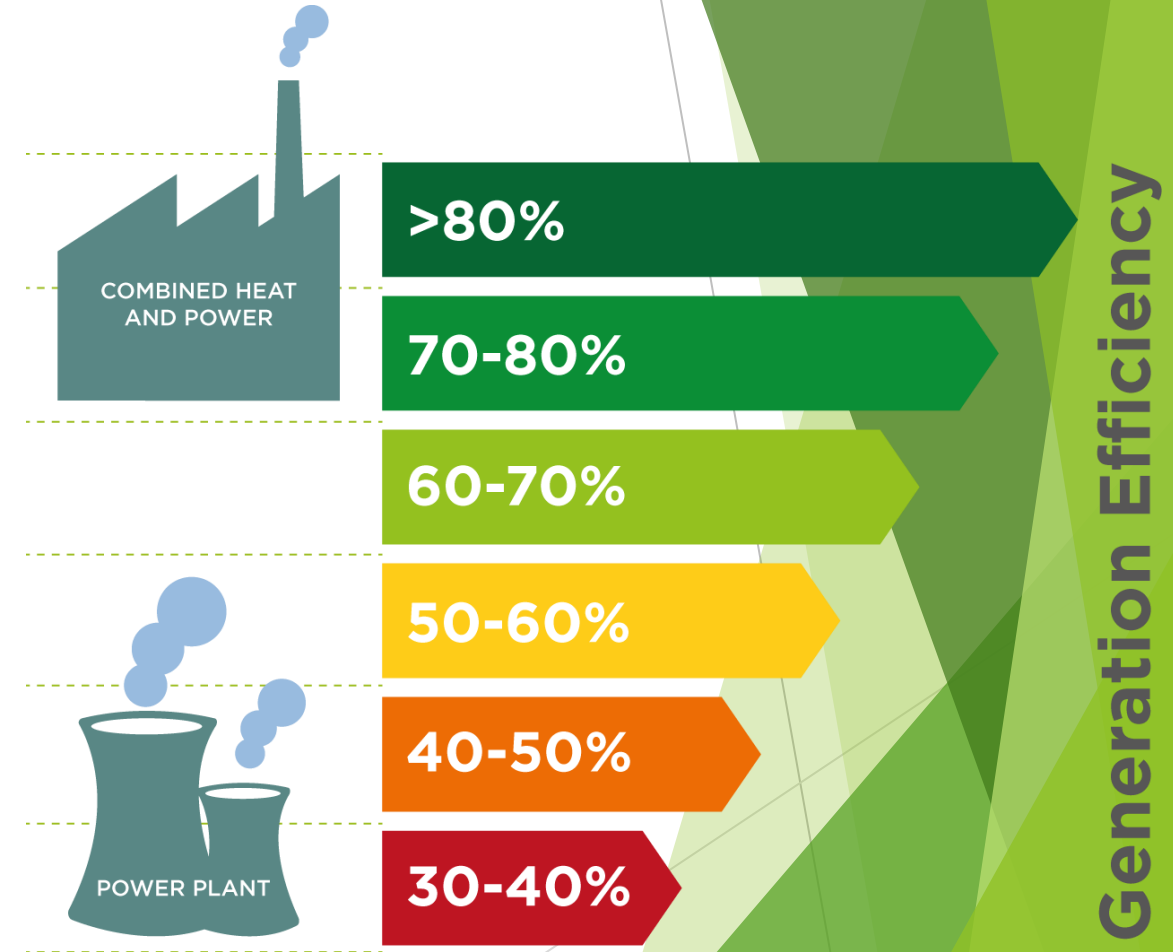
What is CHP?



- ▶ CHP technology uses some the produced heat to generate electricity
- ▶ Electricity is a by-product of a CHP installation
- ▶ Primarily located where both Heat and Electricity are needed
- ▶ Less wasteful than normal means of electricity production
- ▶ CHP installations can reach 80-90% efficiency, compared to average 30-40%

CHP Factors

- ▶ What is needed for CHP to run at peak efficiency?
 - ▶ High Thermal loads
 - ▶ Long operating hours (> 3000-4000 hr/year)
 - ▶ Access to Fuels (Biomass preferred)
 - ▶ Sizing has to be done accordingly to demand



Benefits & Disadvantages

- ▶ Lower energy costs providing affordable heat for households
- ▶ Opportunity to decentralise energy production
- ▶ Improved energy reliability
- ▶ Support grid infrastructure
- ▶ Decrease in air pollution

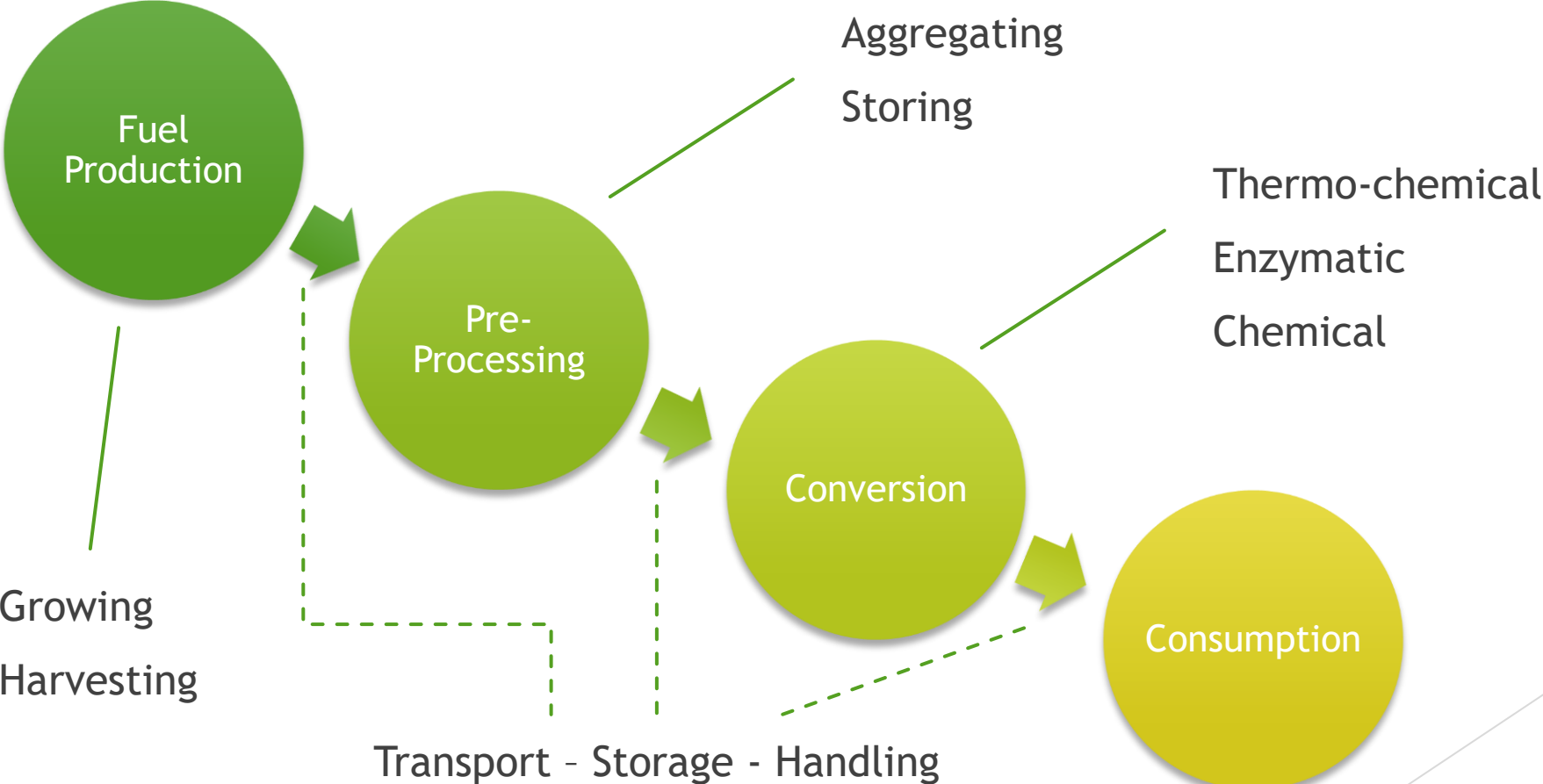
- ▶ Financially intensive because of high Capital Costs
 - ▶ Benefits of scaling/mass production not yet available
 - ▶ Fuel Supply Chain can be an additional cost

- ▶ CHP installations are only somewhat flexible
 - ▶ Heat output cannot be regulated
 - ▶ Unit sizing has to be accurate



Basics of Biomass Supply Chain for CHP

Wood Pellets - Wood Chips - Wood Logs



Supply Chain Example

- ▶ Outer Hebrides (northwest Scotland)
- ▶ No Suppliers in the eventual CHP unit location
- ▶ Biomass has to be moved (increase in delivery prices)
- ▶ Need of a large storage facility
- ▶ Households need to be retrofitted with Micro-CHP
- ▶ Biomass market is only in its emergent stages



CHP Regulations in the NPA Region

- ▶ Most of the NPA countries have their own set of laws on CHP
- ▶ The research has been focused on Biomass and Biogas as CHP fuels
- ▶ The regulations are mostly dedicated to large CHP installations
- ▶ They are a good starting point for a micro-CHP study
- ▶ Accreditation processes have to be strictly followed



Laws and regulations can vary easily, reflecting the current political interests

Example: United Kingdom

Electricity

- ▶ *Feed-In Tariff:*
 - ▶ for small scale RES-E plants (< 5MW)
 - ▶ accreditation process needed
 - ▶ Biogas only
- ▶ *Carbon Price Floor:*
 - ▶ support rates for Biomass/Biogas fuels
- ▶ *Tenders:*
 - ▶ payments between market price and a defined 'strike price'

RHI = Renewable Heating Incentive

Heating/Cooling

- ▶ Biomass fuel only
- ▶ *Non-Domestic RHI:*
 - ▶ support for fixed amount of kWth
 - ▶ payable for 20 years
- ▶ *Domestic RHI:*
 - ▶ accreditation process needed

Northern Ireland has different schemes in place

Thank you for your attention

