



Electricity production from Swiss woody biomass: Assessment of resources, technologies, and costs

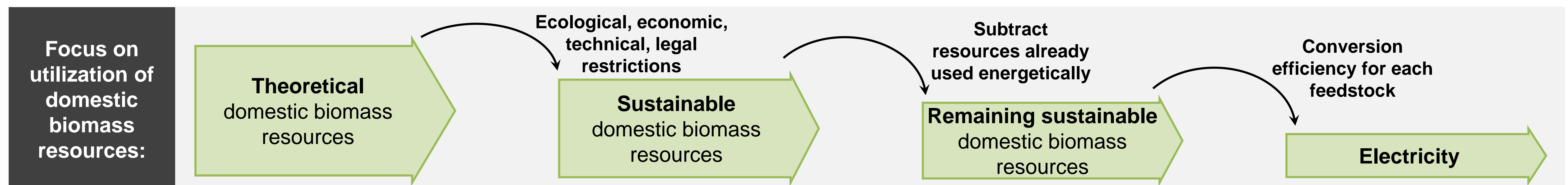
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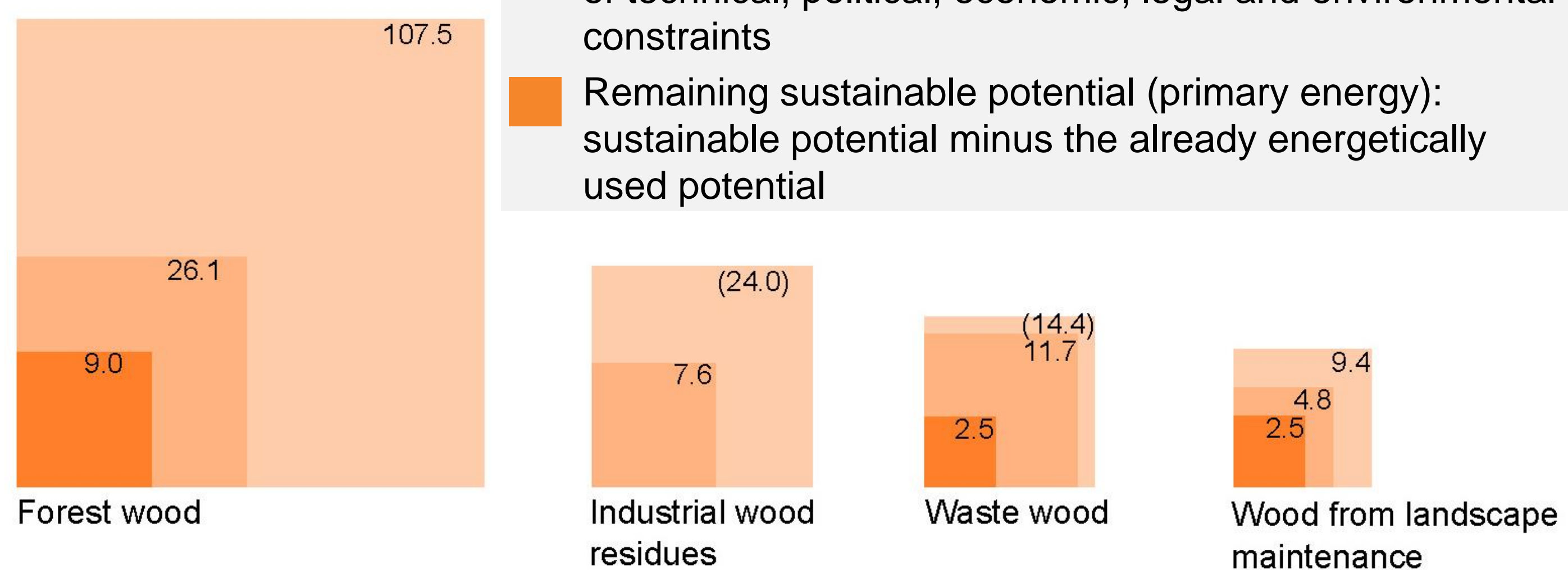
Introduction

Swiss domestic biomass resource potentials are assessed, first on a primary energy basis and then as electricity generation potentials. Costs are also estimated.



Resource Assessment

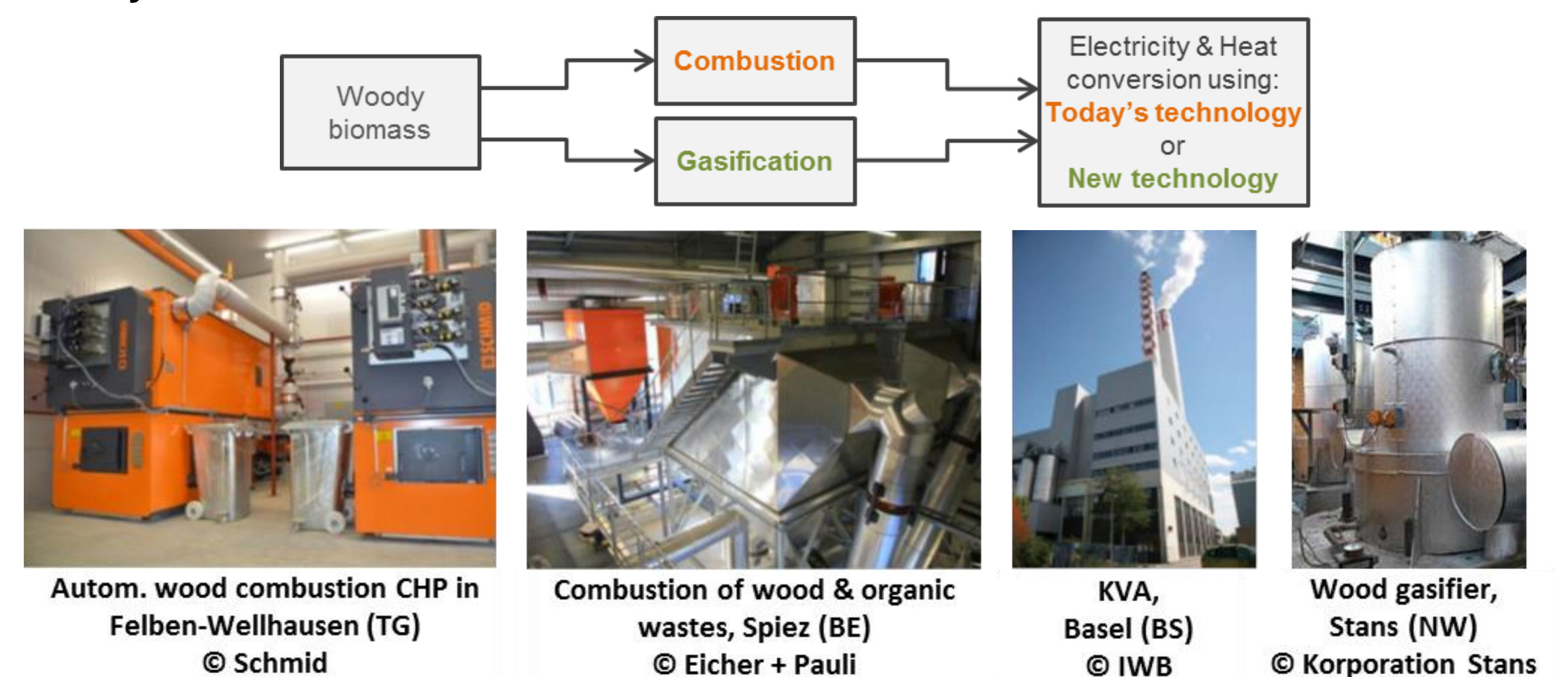
Areas are scaled to PJ/year of energy resources in Switzerland.



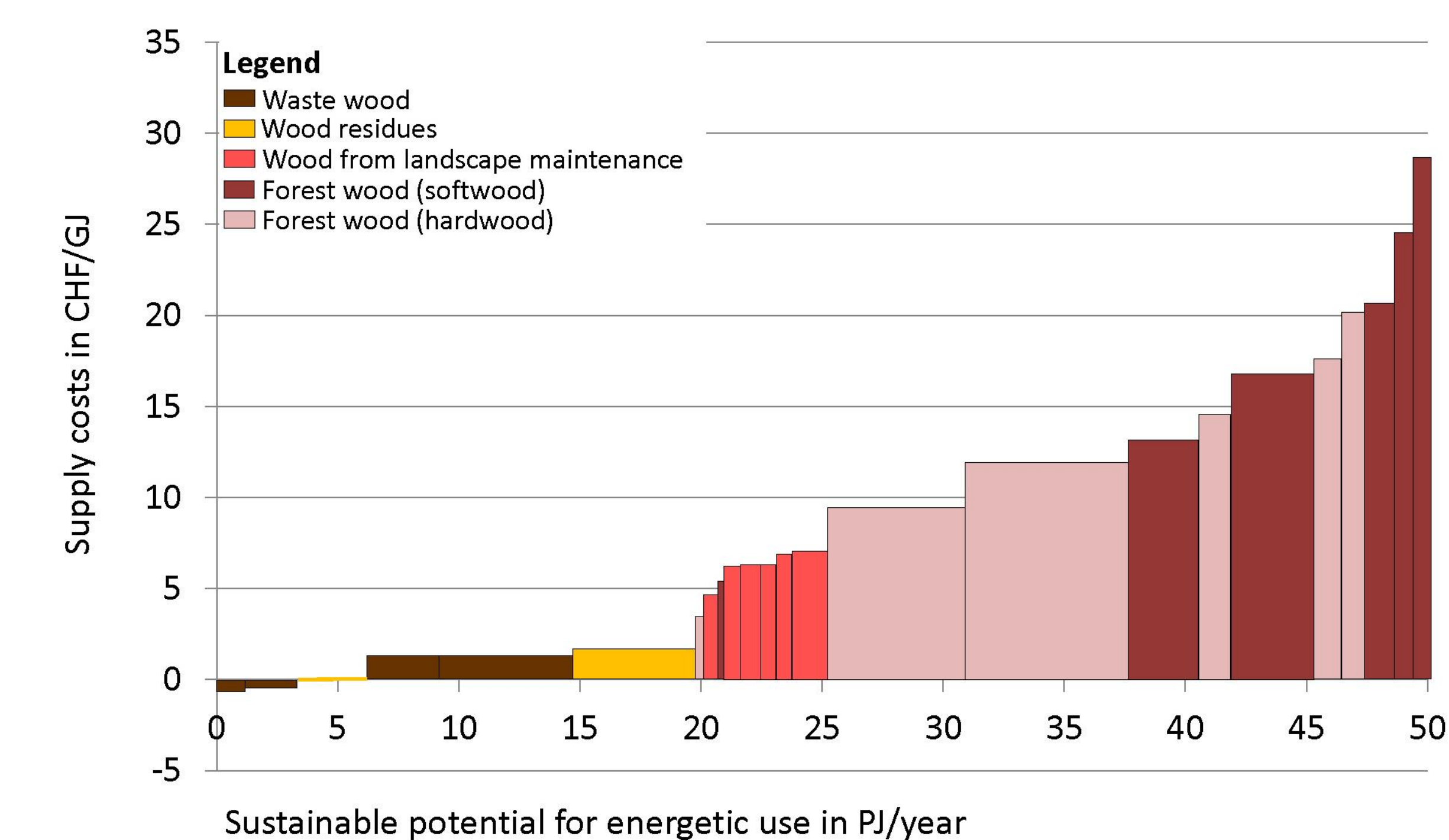
(#): The theoretical potential of residual and waste wood is included in forest energy wood and wood from landscape maintenance.

Electricity Conversion Paths

Technology categories from BFS/BFE energy statistics considered for woody biomass:



Economic Considerations: Feedstock Costs

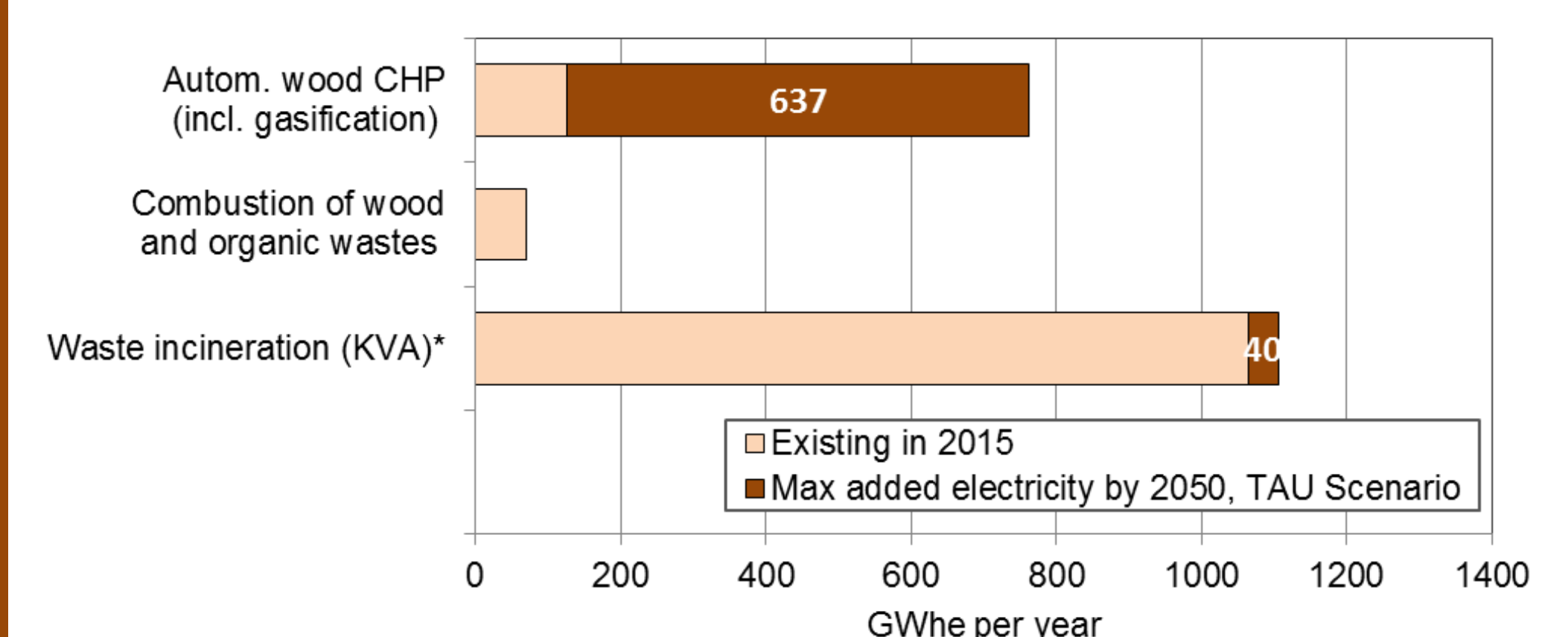


Electricity Potentials: Today's Technology

Assumptions: Technology as Usual (TAU)

- Redirect wood from current heat-only uses to CHP systems
- Gradually use all remaining sustainable biomass feedstock in highest-efficiency of today's technology:
 - Combustion rather than gasification
 - Efficiencies from 2015 Swiss Renew. Energy Statistics

Results: Electricity Potentials (GWh_e)



Max total added relative to 2015: 0.7 TWh_e (2.4 PJ_e)

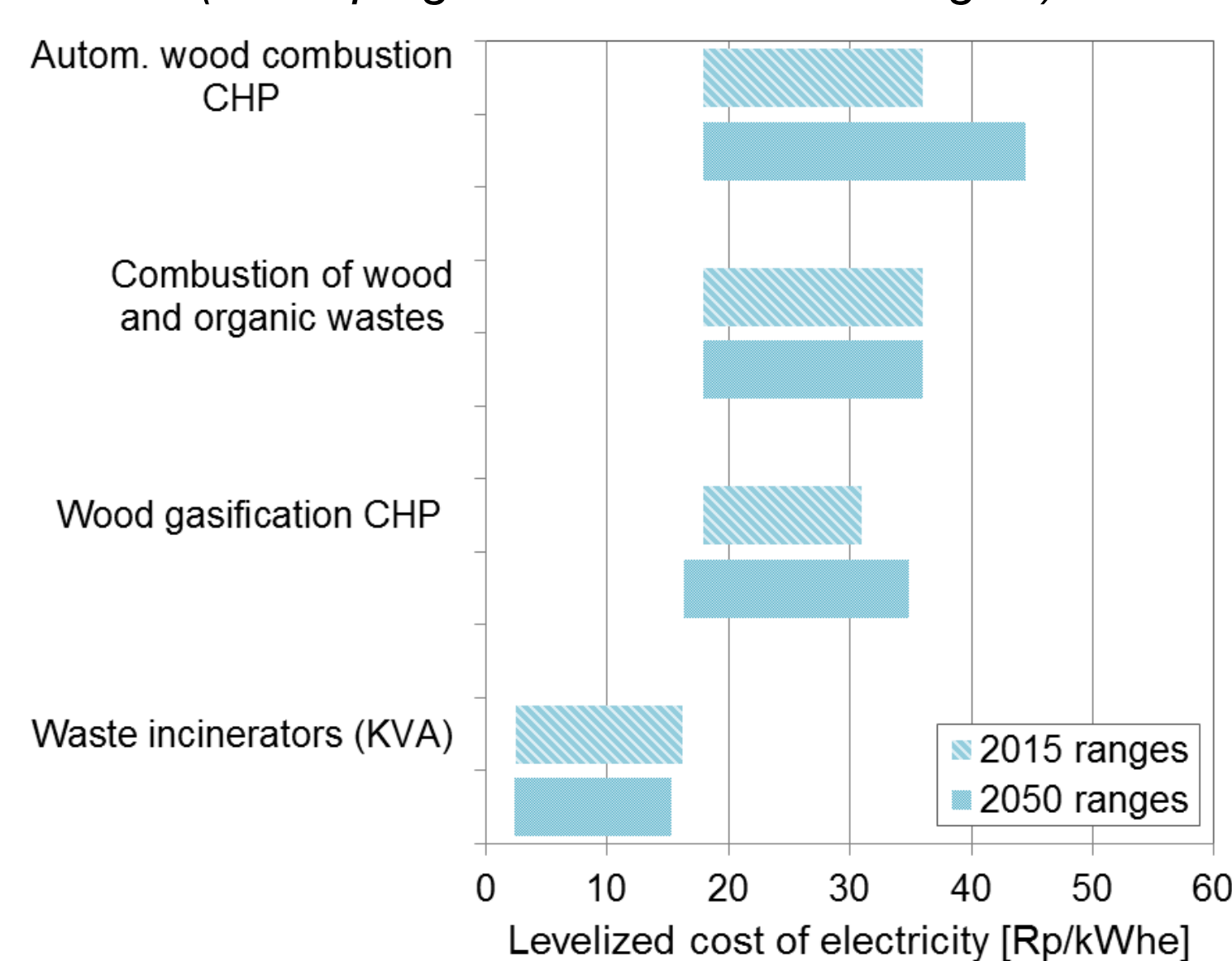
Economic Considerations: Electricity Costs

Electricity costs depend on the business model of the sector:

	Income for processing waste	No waste processing income
Significant income from heat sales	Waste incinerators, wastewater treatment plants,	Wood-based systems
Low income from heat sales	some biogas plants	Small agricultural systems

Least expensive cost of electricity (light blue)
Most expensive cost of electricity (dark blue)

Electricity cost ranges by conversion tech (see top right column for technologies)

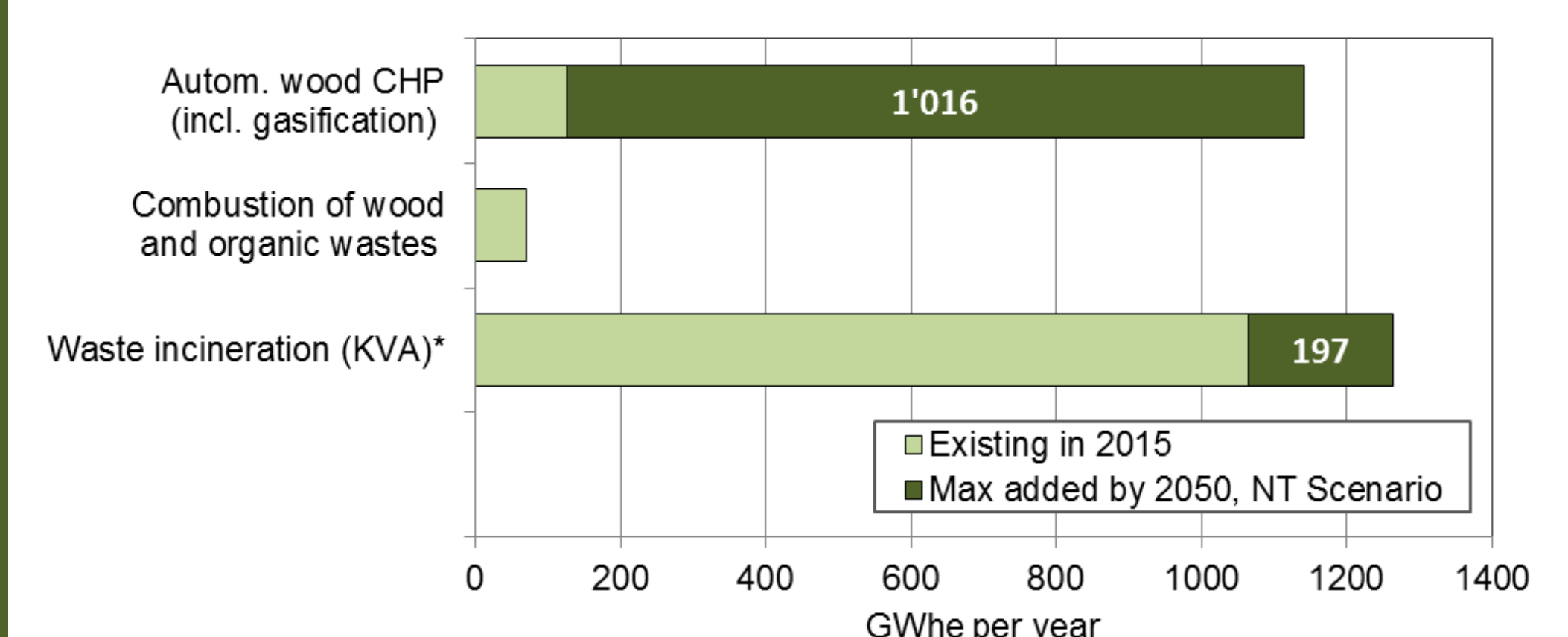


Electricity Potentials: New Technology

Assumptions: New Technology (NT)

- Redirect wood from current heat-only uses to CHP systems
- Gradually use all remaining sustainable biomass feedstock in new, higher-efficiency technologies:
 - Gasification CHP for large scale
 - Externally-fired gas turbine for small scale

Results: Electricity Potentials (GWh_e)



Max total added relative to 2015: 1.2 TWh_e (4.4 PJ_e)

*Note that this category includes woody and non-woody feedstocks.