

# MicroXyloCogen – wood based cogeneration

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21<sup>th</sup> of August 2018

# Wood as an energy resource

The one edge of the sword

- ✓ Results of a unique natural process of sun energy storage
- ✓ Renewable
- ✓ Local
- ✓ Non toxic and non hazardous
- ✓ High exergy content



# Wood as an energy resource

And the other one ...

- ✓ Heterogeneous, humid and variable solid fuel
- ✓ Containing ashes
- ✓ Low geographical density  
3,8 tonne/(hectar·year), dry matter
- ✓ Low potential  
 $\sim 3 \cdot 10^6 \text{ m}^3/\text{year}$



# Wood energy utilisation

The challenge ...

- ✓ Taking advantage of the high exergy potential → generating electricity
- ✓ Ressources scarcity and low density → utilisation on site and recovering as much heat as possible



# Wood energy utilisation

One way...

- ✓ Distributed heat and power generation through small size plants ( $1 \text{ kW}_e$  &  $5 \text{ kW}_{th}$ ) for single family homes
- ✓ Heat storage for production shift when no other renewable electricity sources are available



# Wood energy utilisation

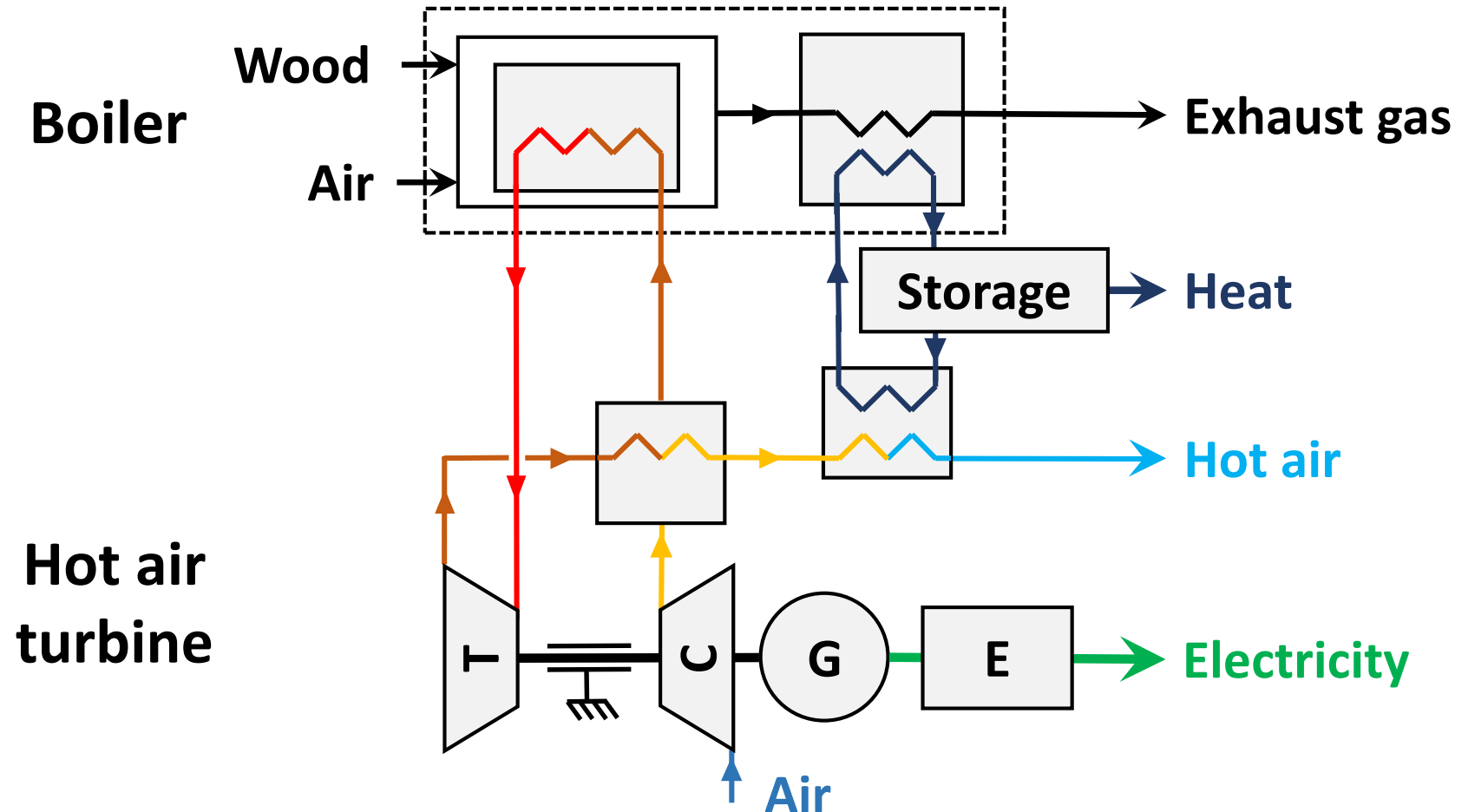
Low cost and reliable technology ...

- ✓ Brayton based hot air gas cycle  
→ one single moving part
- ✓ With external wood combustion
- ✓ Integration into a conventional fully automated wood pellet boiler with heat storage



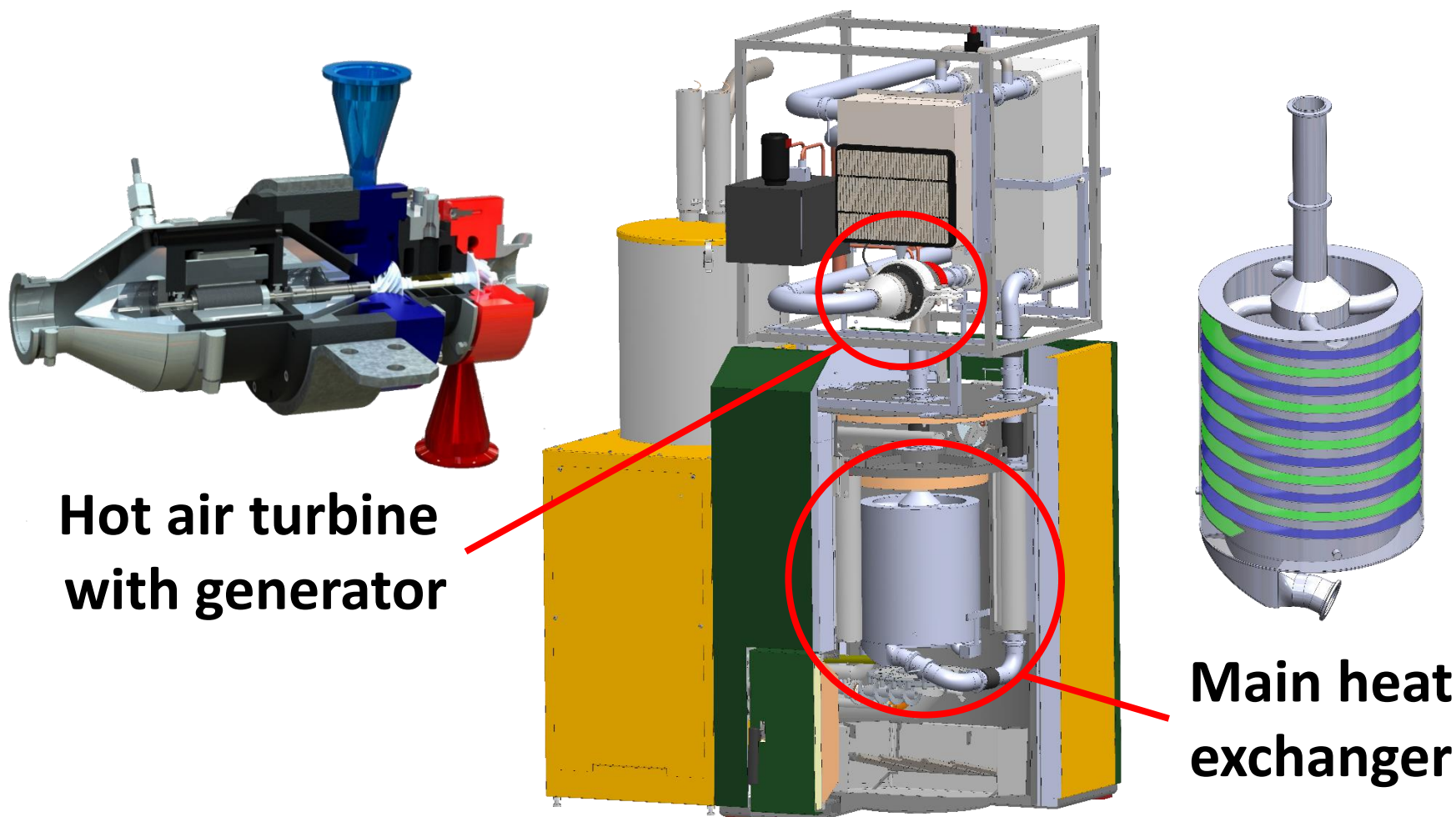
# Brayton hot air cycle

Low cost an reliable technology ...



# Concept design

Integration into an existing boiler ...





## Next steps

Until June 2020 ...

- ✓ Manufacturing and separate test of subsystems
- ✓ Integration to the boiler and commissioning
- ✓ System characterisation and optimisation



## Financing

- ✓ State of Vaud
- ✓ Swiss Federal Office of Energy
- ✓ Geneva Industrial Services,  
New Renewable Energies



This research project is part of the Swiss  
Competence Center for Energy Research SCCER  
biosweet of the Swiss Innovation Agency Innosuisse



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# Thank you for your attention

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