


*IEA Vernetzungstreffen
Linz, Austria
28. Jan. 2025*

 **Bundesministerium**
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie

Christian Doppler
Forschungsgesellschaft  **agepol**

AGEING OF POLYMERIC MATERIALS AND HYBRID LAMINATES (CDL-AGEPOL)

SUPERIMPOSED ENVIRONMENTAL & MECHANICAL BEHAVIOR

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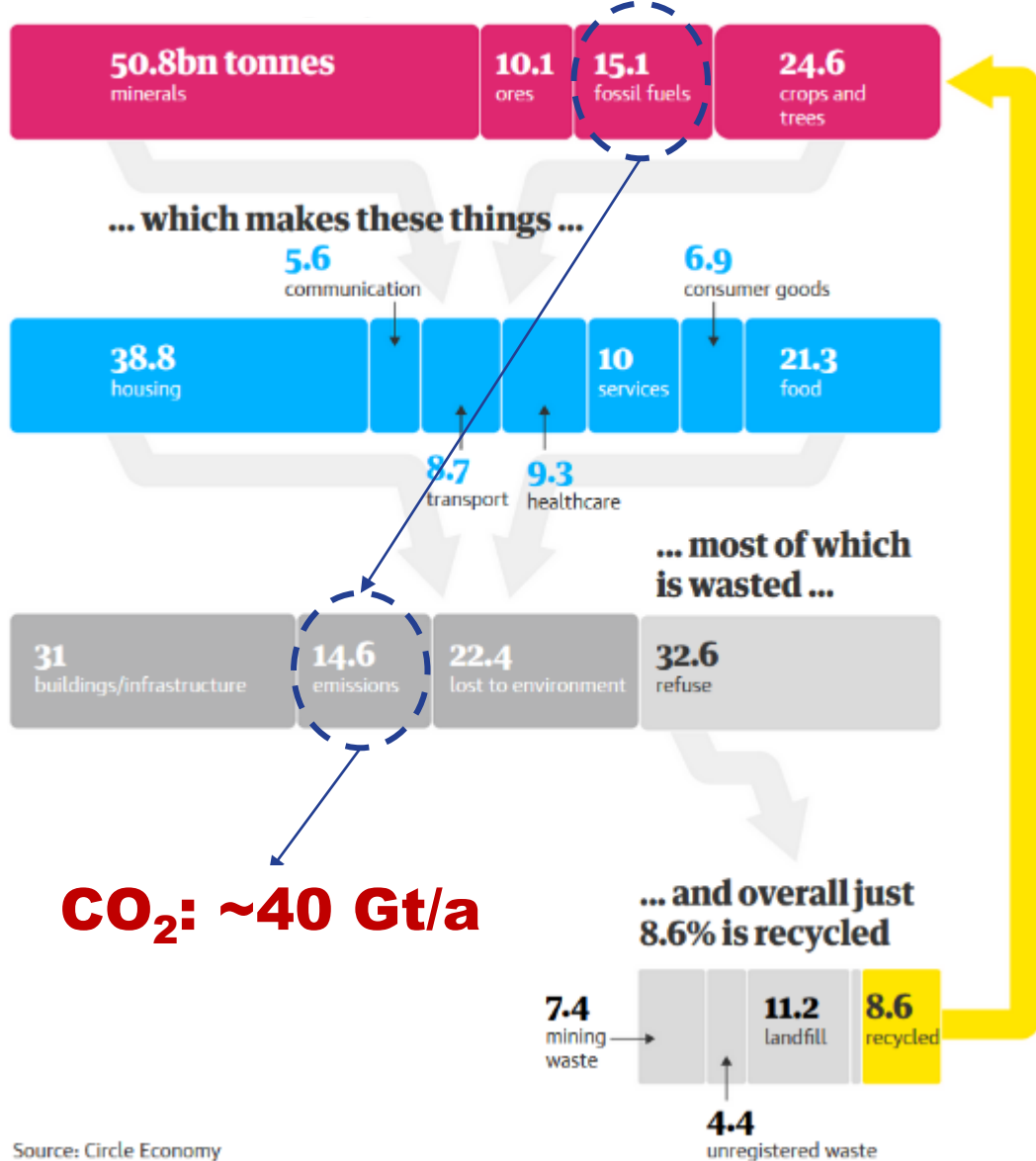
ZONA

voestalpine
ONE STEP AHEAD.





 **BOREALIS**

SUSTAINABILITY & CIRCULAR ECONOMY

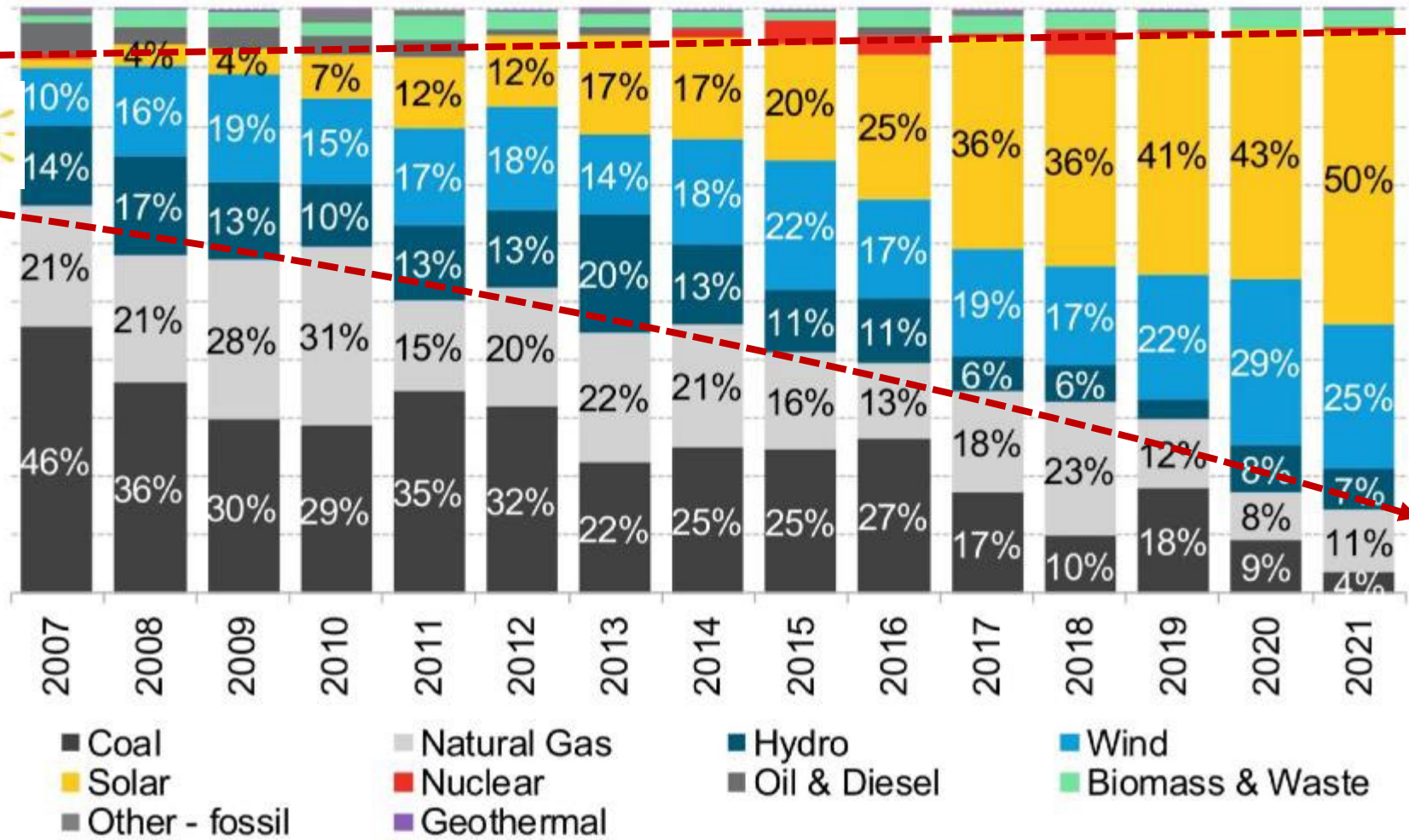
Raw materials: >100 Gt/a



Core elements of a Circular Economy

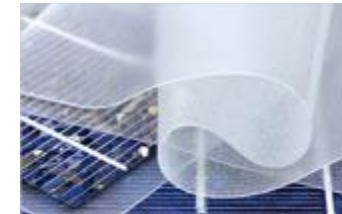
CIRCLE ECONOMY'S CORE ELEMENTS	STRATEGIES FOR RESOURCE CYCLING ¹³	10R FRAMEWORK	5R FRAMEWORK
 <p>Prioritise Regenerative Resources</p>		Refuse	
		Reduce	Reduce
		Rethink	CO₂: ~40 Gt/a
 <p>Stretch the Lifetime</p>	Slow flows	Reuse	Reuse
		Repair	Repair
		Refurbish	Refurbish
		Remanufacture	
 <p>Use Waste as a Resource</p>	Close flows	Repurpose	
		Recycle	Recycle
		Recover	

PLASTICS & ENERGY TRANSITION



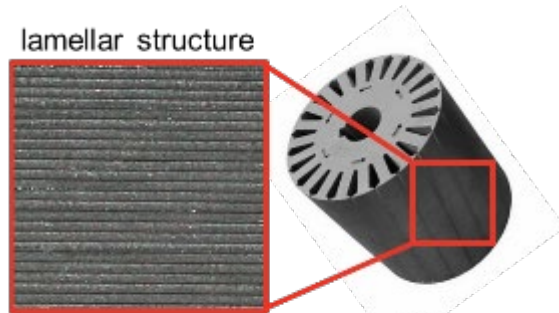
Source: BloombergNEF. Note: Share of global capacity additions excluding retirements.

Plastics enable solar electricity!

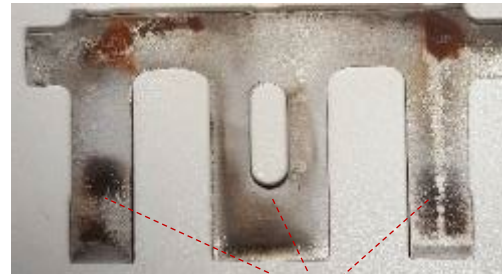


DELAMINATION DRIVEN BY SUPERIMPOSED STRESSES & LOCAL AGEING

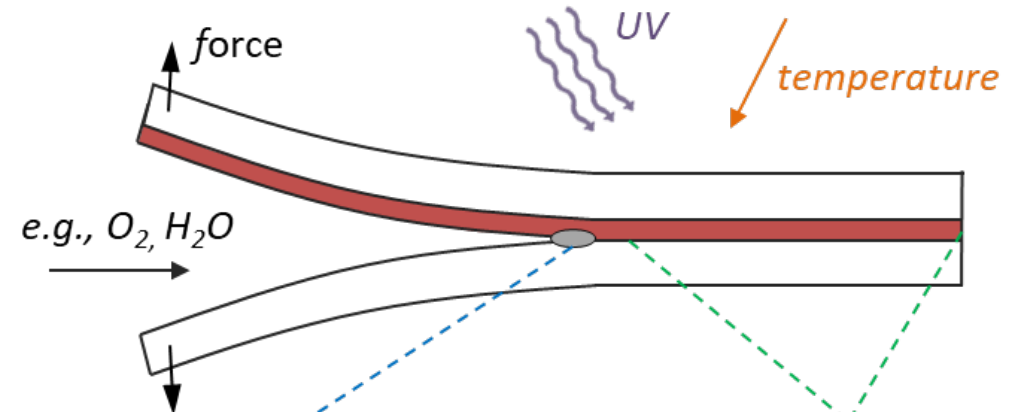
voestalpine



- non-oriented FeSiAl sheet (0.3-1.0 mm)
- thermoset varnish (1-10 μm)



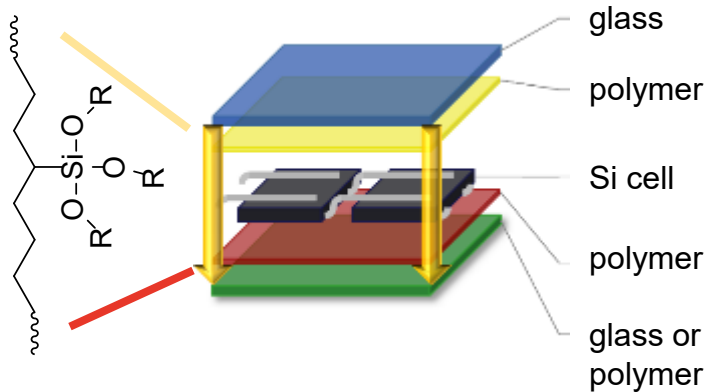
fatigue delamination
(cyclic intermittent)



local ageing
(at crack tip or front,
nano porous morphology,
high mechanical stress)

global ageing
(far ahead crack tip,
bulk morphology,
low mechanical stress)

BOREALIS

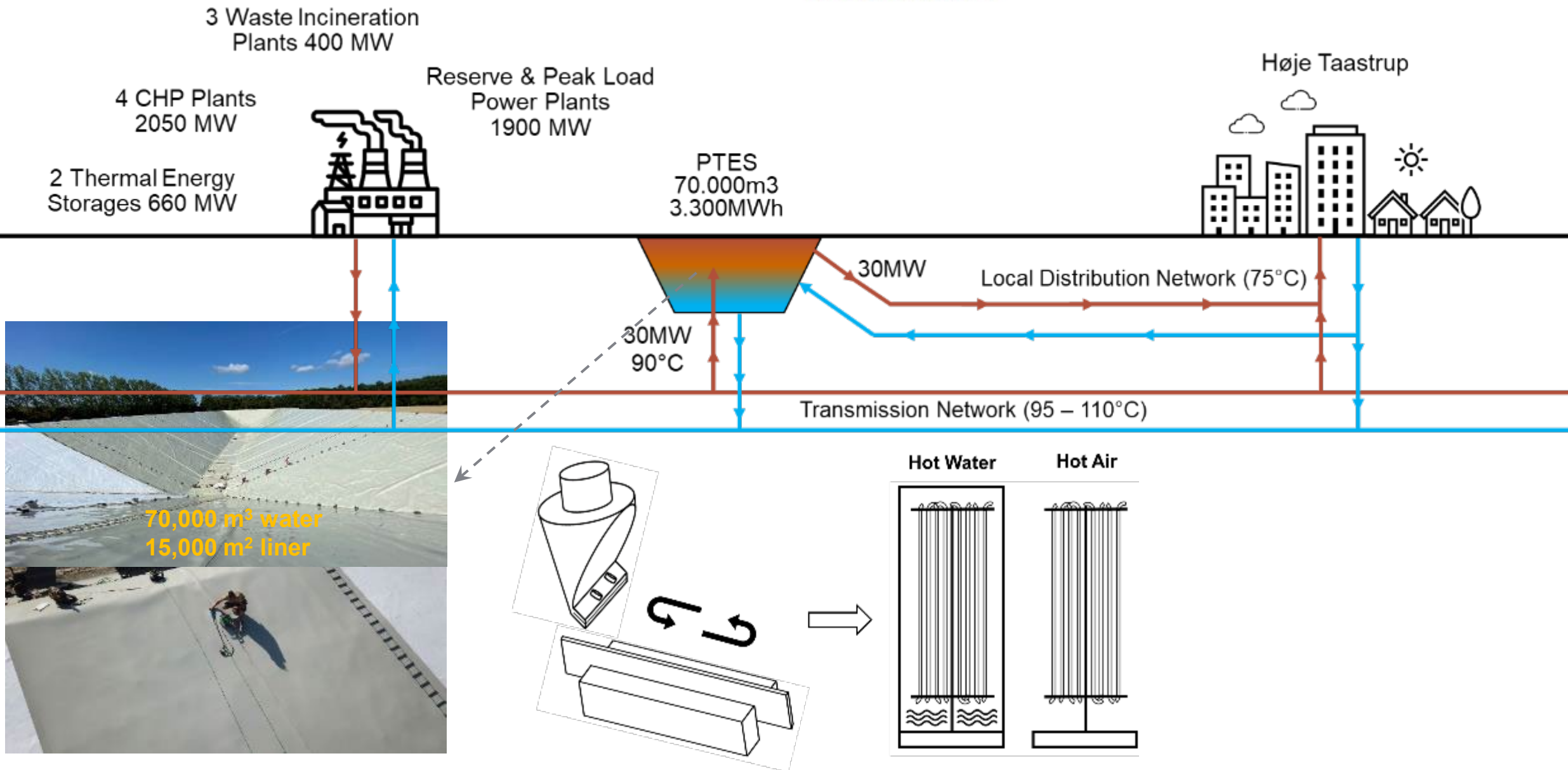


FACTS & FIGURES:

Budget: **3.5 mio. EURO**

Duration: 7 years

STORAGE OF THERMAL ENERGY



STORAGE OF THERMAL ENERGY

