

Fire safety of timber buildings – are we competent enough?

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The potential benefits are enormous!



Barriers

Fire

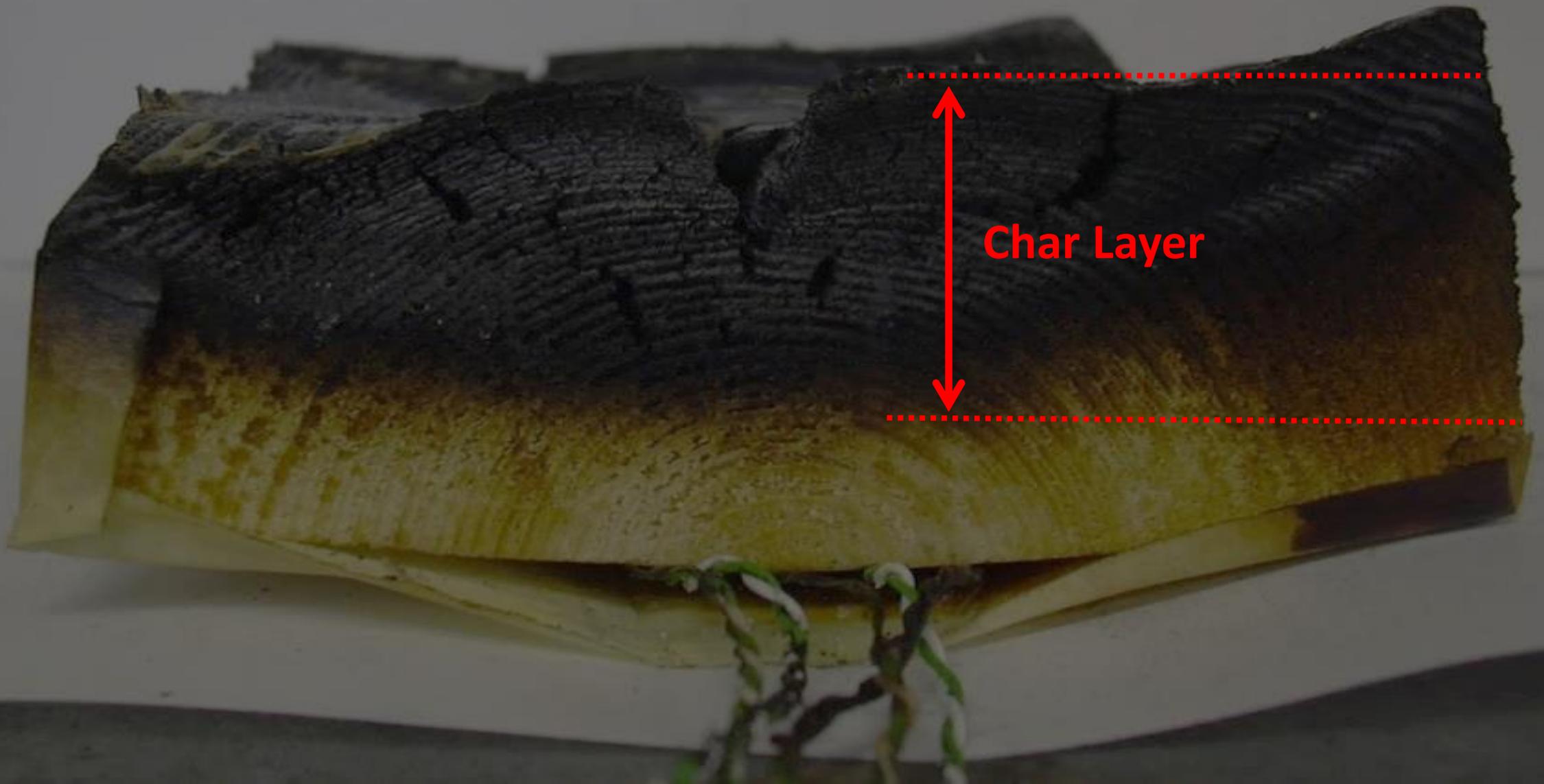


Water

Realizing the Benefits of Timber

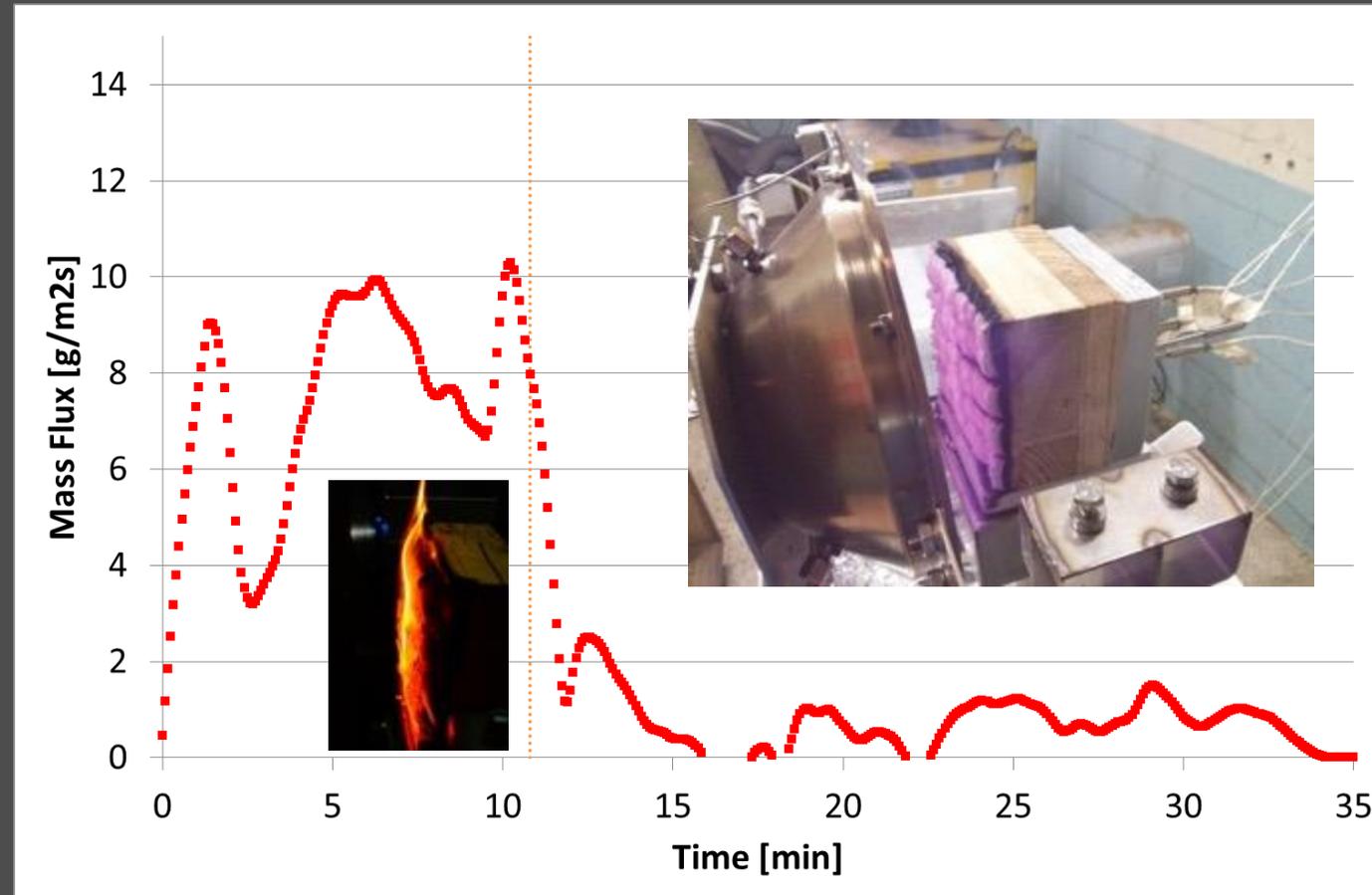
- No matter what is the system used timber has the potential to bring benefits
 - Timber needs to be used in an appropriate manner
 - Benefits need to be maximized
- Fire safe design of complex timber buildings is technically difficult
- For timber to be used in an appropriate manner, the user needs to have an appropriate level of knowledge

Burning Dominated by Charring



Char Layer

Shifts the Focus to Self-Extinction



Structural Design for Burn-Out

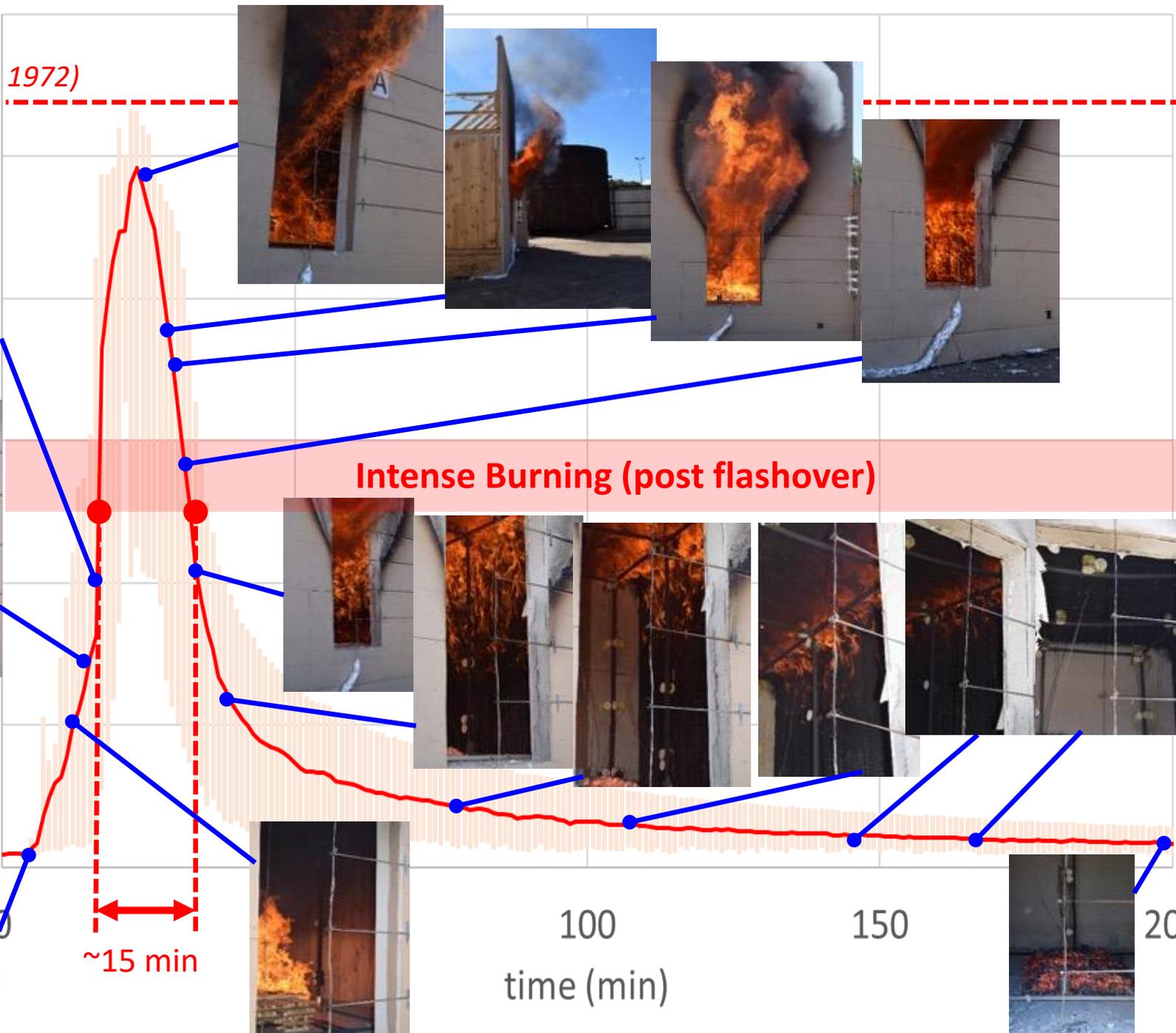
- Once all combustible furnishings are consumed (burn-out), the Structural Timber loses the heat feedback from the fire and the flame should quench

1200

T_{max} (Thomas, 1972)



200



Intense Burning (post flashover)

~15 min

100
time (min)

150

200

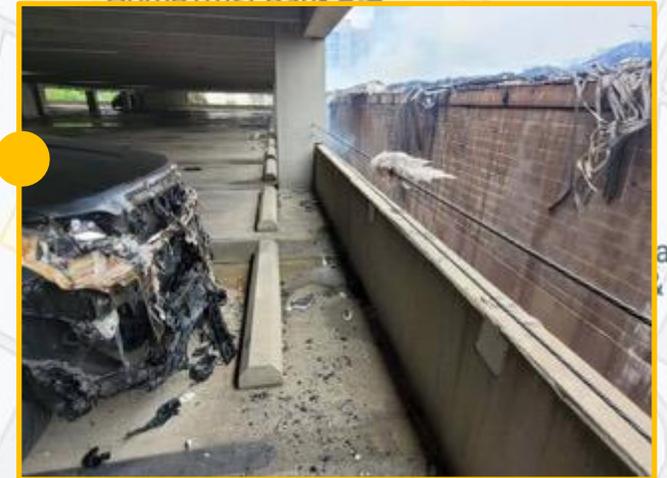
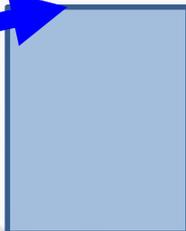
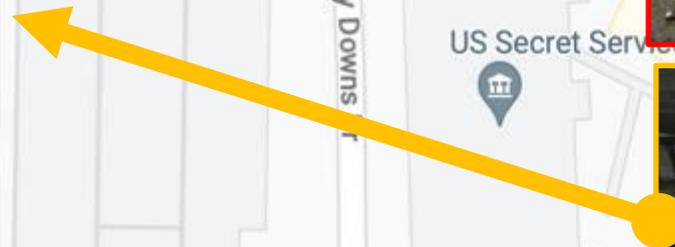


Design for Burn-out:

What is the expected performance of encapsulation?

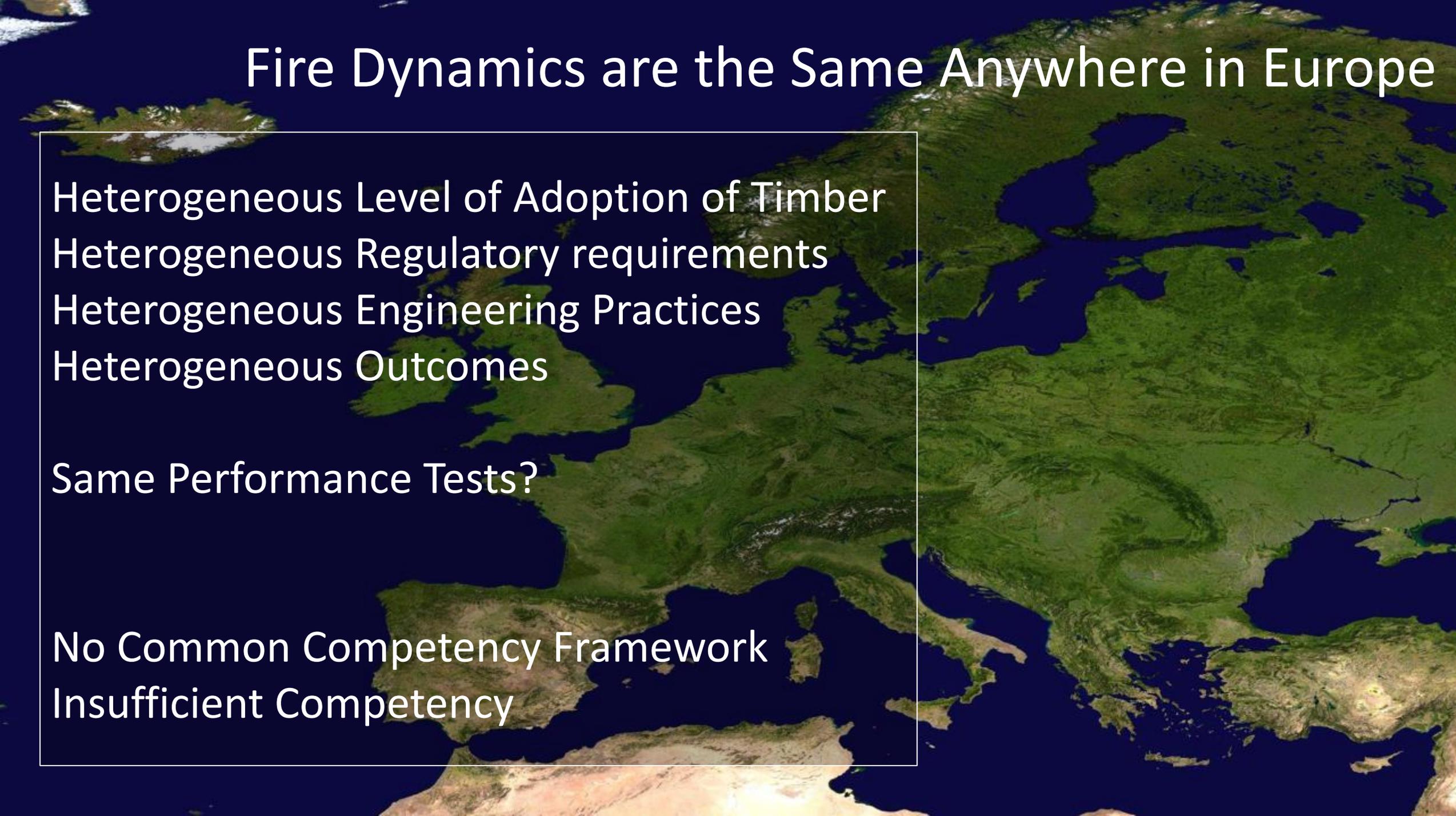
Understanding Consequences

Charlotte, USA – 18 May 2023



Timber burns ... but actually ... it is an excellent construction material when it comes to a fire!

Fire Dynamics are the Same Anywhere in Europe

A satellite-style map of Europe and its surrounding regions, including parts of North Africa and the Middle East. The map shows green landmasses, blue oceans, and brownish desert areas. The text is overlaid on the map.

Heterogeneous Level of Adoption of Timber
Heterogeneous Regulatory requirements
Heterogeneous Engineering Practices
Heterogeneous Outcomes

Same Performance Tests?

No Common Competency Framework
Insufficient Competency

But We Need to be Careful!

- Relaxation of codes regarding timber structures
- Confusion with cladding issues, adhesives, fire fighting
- Concessions that are not fully reflected
 - Objective: Significant increase in allowable height
 - Concession: More extensive provision of sprinklers
 - Concession: More significant Fire Resistance Requirements
- We need to address the real problems, because all these issues affect the use of timber for structures

How do we Realize the Potential of Timber?

- We have to do it right!
- Guarantee that we produce knowledgeable designs
- We need a common framework of competency!



Thankyou!