



SAFETY ON TENDER

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RISE Fire Research as



Safety on tender

Safety on tender

■ **What is safety?**

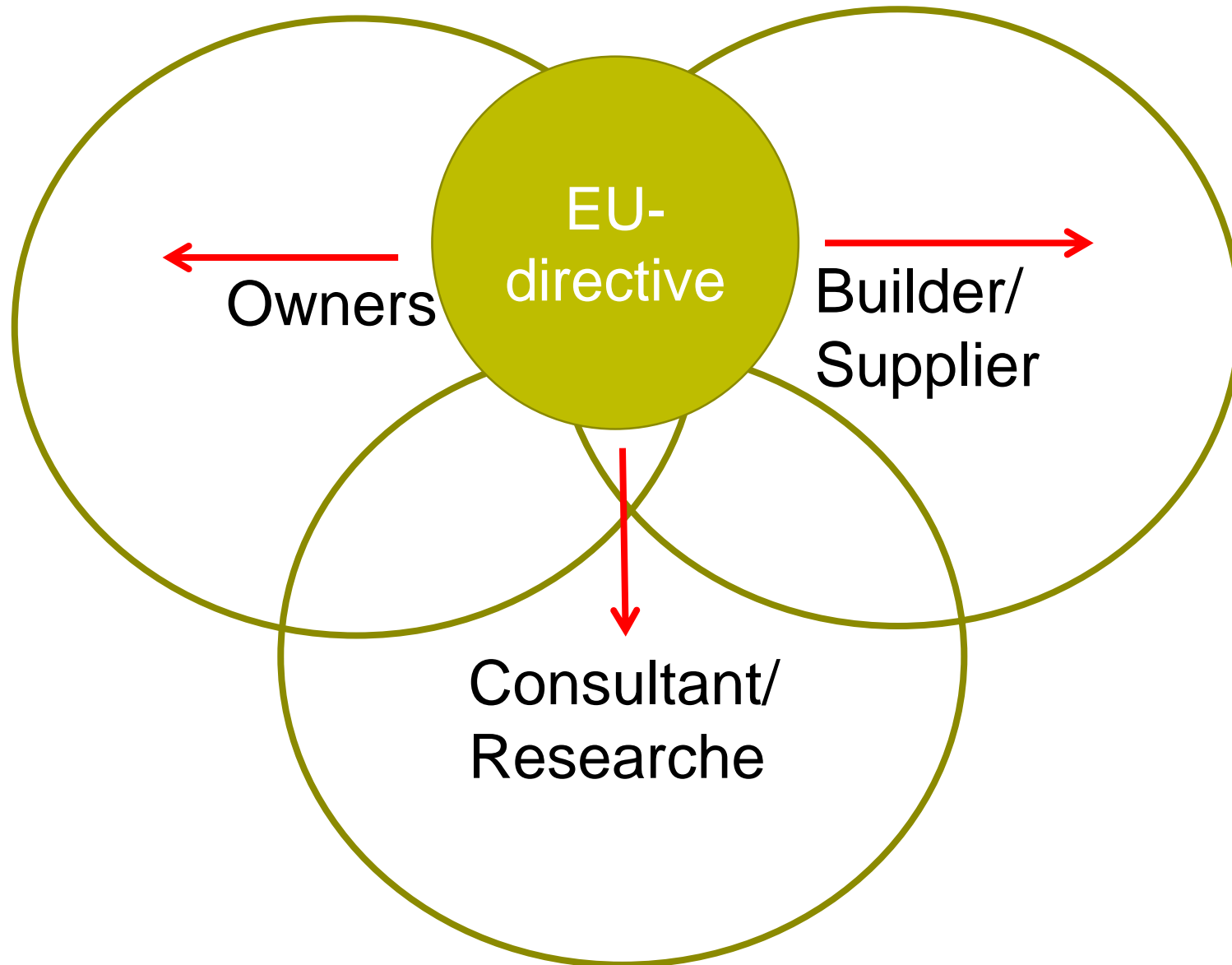
- Personnel safety
- Infrastructure safety
- Transportation safety
- Public perceived safety

■ **Who decides safety level and way?**

- Is there political agendas?
- Is there financial agendas?
- Regulation?

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Motivation



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- Legislation and directive must not be an obstacle for innovation and optimization
- New technology needs correct documentation
 - Testing in realistic scenario and scale
 - Even CFD models needs to verified
- Even known technology are not fully documented
 - Ventilation
 - Evacuation lighting

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Distinctively Norwegian issues

- Long single bore tunnels.
- Large gradient.
- Strait crossings.
- Sparsely populated country

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Hope for the future

- Assign each new and old safety measure with a number of "added safety" based on there performance.
- These numbers could be put into table, including cost for the safety measure.
- Each tunnel should then be evaluated and a required totale safety level number determined

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Example

Safety measure	Added safety	Installation Cost	Maintenance cost	Description
Measure 1	20	100'	20'	
Measure 2	10	25'	5'	
Measure 3	13	200'	1'	
Measure 4	35	150'	15'	
Measure 5	25	90'	18'	

Possible to optimize on cost and safety



THANK YOU!

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