

# Why 10 to 12 demo plants?

## CO2 capturing technology options

2. Pre-combustion (2 options)
3. Post-combustion (>2 options)
4. Oxy-fuel (>2 options)

## Storage type

2. Depleted oil & gas fields
3. Saline water reservoirs (aquifers)
4. Extended oil recovery (EOR)
5. Deep unmineable coal

Furthermore, for the sake of creating infrastructure an environment with sufficient sources and sinks for CO<sub>2</sub> is vital (i.e. more than 2-3 sources)!!

An appropriate mix of geography and scale will be required.

## Fuel type

2. Gas
3. Secondary fuels
4. Coal



## ILLUSTRATIVE

### Coal (3 types)

- Depleted oil & gas
- Saline aquifers
- EOR
- Deep unmineable coal

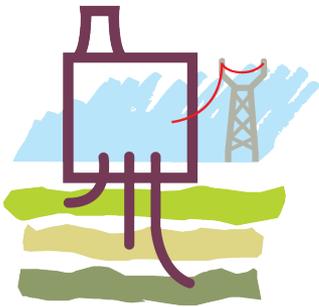
### Secondary fuels

- Depleted oil & gas
- Saline aquifers
- EOR
- Deep unmineable coal

### Gas

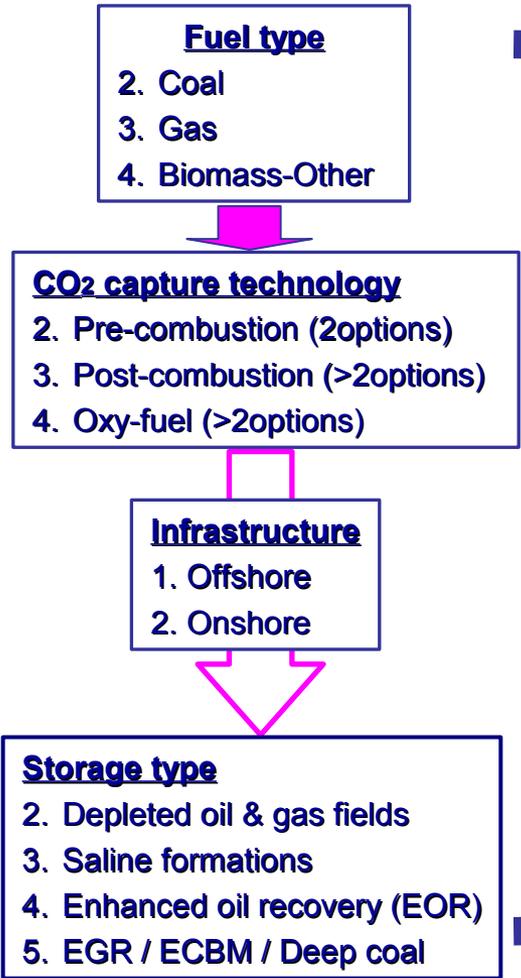
- Depleted oil & gas
- Saline aquifers
- EOR
- Deep unmineable coal

	Oxy-fuel (2x)	Pre-combustion (2x)	Post-combustion (2x)
Coal (3 types)			
• Depleted oil & gas		✓	
• Saline aquifers	✓		
• EOR			✓
• Deep unmineable coal	⋯	✓	
Secondary fuels			
• Depleted oil & gas			✓
• Saline aquifers		✓	
• EOR	✓		
• Deep unmineable coal			⋯
Gas			
• Depleted oil & gas			
• Saline aquifers		✓	
• EOR	✓		
• Deep unmineable coal			✓

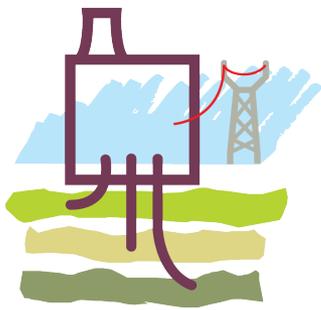


# Why 10 to 12 demo plants?

- Multiple technology combinations demand it



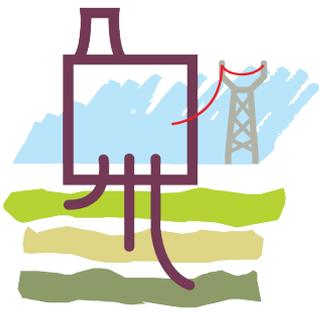
	Oxy-fuel (>2x)	Pre-combustion (>2x)	Post-combustion (2x)
<u>Infrastructure</u>			
• Offshore	✓	✓	✓
• Onshore	✓	✓	✓
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<u>Coal</u>			
• Depleted oil & gas		✓	
• Saline formation	✓		
• EOR			✓
• EGR / ECBM / etc	⋯		
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<u>Gas</u>			
• Depleted oil & gas			✓
• Saline formation		✓	
• EOR	✓		
• EGR / ECBM / etc			⋯
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<u>Biomass - Other</u>			
• Depleted oil & gas			✓
• Saline formations		✓	
• EOR		✓	
• EGR / ECBM / etc	✓		✓



# Capture technologies

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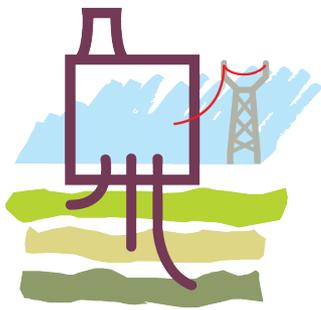
- Pre-combustion and Oxy-fired options offers several technologies opportunity for commerciality with multiple fuels
- Post-combustion with multiple types of capture can also be used in large non-power point source emitters
- Opportunity for integration options, new compressors, pumps, control systems, unique for each technology option
- Environmental studies will validate ability to capture CO<sub>2</sub> safely with results communicated effectively to public



# Infrastructure

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- Large scale plants must be tied to storage via beginning of a rationally designed infrastructure
- Offshore and onshore systems need to be configured
- Imaginative technology solutions using improved transport materiel, compression, pump and seal options will be required
- Regularization of EU wide transport is imperative
- Validation of CO<sub>2</sub> stream specifications must be explored with proper infrastructure and storage options
- Storing several gigatonnes of CO<sub>2</sub> will require innovative trans-border EU cooperation



# Storage options

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- Each storage option must be vetted with potentially differing CO<sub>2</sub> fluid specifications
- Measurement, monitoring and verification (MMV) of paramount importance to ensure safety in all storage medium, which will be communicated for public acceptance
- Environmental studies will buttress MMV and add another layer of confidence to public
- EOR, where applicable, may allow for cheaper saline formation storage and saline formation may do the same for EOR based on best available initial storage option.