Innovative solutions supporting resilience of dairy farms in Netherlands

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Topics

- What does resilience mean?
- Needs within the context of challenges Dutch dairy sector
- Strategies in general and priorities group of farmers

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Meeting with farmers, education and advisors
about changes in the dairy sector (needs) and solutions

What is te meaning of resilience to you?

	Alternative term	Number of times mentioned
1	**Adaptability,** adapt, adaptation, change, cope with	8
2	**Recovering capacity**, recovery, absorbing shocks	6
3	**Robust farm concept**, resistance, own strength	3
4	**Flexibility**	2
5	**Anticipating**	2
6	**Stress resistant**	1
7	**Good revenue model**	1
8	**Tipping point**	1

Resilience

1. Robust
2. Adaptation
3. Transformation

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The Dutch dairy sector

- 14.300 dairy farms, 1.5 million dairy cows
- 4.2 % organic farmers
- 110 cows per farm per farm
- 58 ha per farm, 50 ha grassland, 8 ha maize
- 2.1 cows per ha
- 59% sand, 29% clay and 12% peat soil
- 86% farms grazing
- 9000 kg milk per cow

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Many environmental challenges

- 41% reduction NH3 by agriculture in 2030
- 55% less green house gases in 2030 vs 1990
- Water quality: low nitrogen and phosphate application; 3 m without application along ditches
- Nitrate directive: No more derogation on manure -> max 43 ton manure / ha
- Biodiversity

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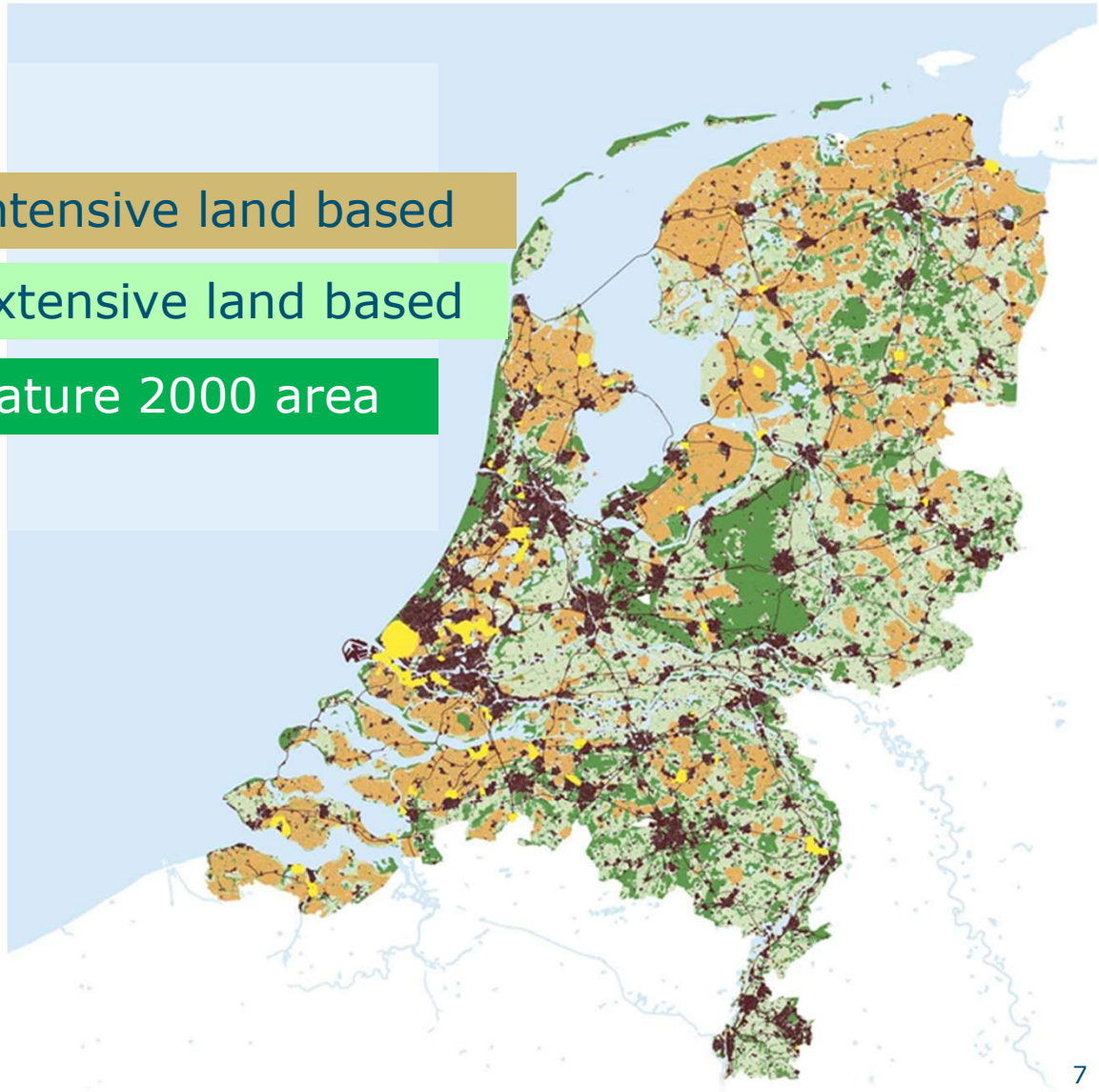
Challenge to combine reduction emissions with land use planning



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Issues around Agricultural Agreement

- Stimulus to keep less animals, more grass and extensive
- Stimulus to innovate and secure them
- Measure emissions and manage with sensor technology
- Certified calculating system / mineral accounting system
- Urge to society and retail:
  for higher agricultural prices
  and payment for eco services


So far: no agreement

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Highest scoring major changes and their importance

Major change (in the next 10 years)	Avg. score importance (1-5 range)
Sustainability themes	
Environment	4.30
Soil fertility	4.10
Greenhouse gases	3.90
Animal welfare	3.70
Circular agriculture	
Circular agriculture	4.00
Entrepreneurship / diversification	
Milk price / bonus price	4.00
Farm succession	3.60
Policy The Netherlands	
Inconsistancy of government policy	3.80
Environmental permits	3.80
Land rent laws	3.50
EU policy	
CAP: doing more for less money	3.80
Farm2Fork policy	3.50
Economy / costs	
Cost increases	4.00
Market and society	
Dairy cooperatives less dominant	3.50

Highest scoring adaptations and their relevance

Adaptation to increase resilience	Average score of relevance (range 1 to 5)
Develop a revenue model	
Create margins	4,5
Improving valorization milk/meat	4,2
Generate money for adaptations	4,0
Identify opportunities and seize them	
Identify opportunities	4,5
Be aware of opportunities and threats	4,4
Making a (business) plan to prepare for the future	
Make a medium-term plan	4,4
Personal development / knowing personal strengths	
Know your strengths and weaknesses	4,3
Acquire knowledge	4,3
Adapt farm / develop business	
Preparing soil for the future	4,2
Exploit the social environment	
Communicate, collaborate and connect	3,3

Strategies for the future; which direction?

- Scaling up ⟺ Scaling down
- Intensive ⟺ Extensive / grazing
- Low cost ⟺ Added value
- High tech ⟺ Natural
- Specialize ⟺ Mixed farming
- Animal ⟺ Plant
- Innovate ⟺ Close farms
- Farm level ⟺ Regional level

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Solutions group farmers

1. Optimize and Adapt
   - less emissions
   - welfare
   - biodiversity
2. Transform
   - new business
     (food, energy, ...)
   - entrepreneurship

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Examples adaptation and new revenue model

- Housing system in relation to animal welfare, manure quality and lower emissions of ammonia and methane
    - Sand bedding in cubicles
    - Freewalk housing
    - Separation urine and feces
- Added value milk: freewalk cheese and A2 milk
- Energy production:
    - collect methane from manure storages
    - Produce hydrogen (H2)
- Total concept: precision farming, climate, nature and circular

Freewalk housing

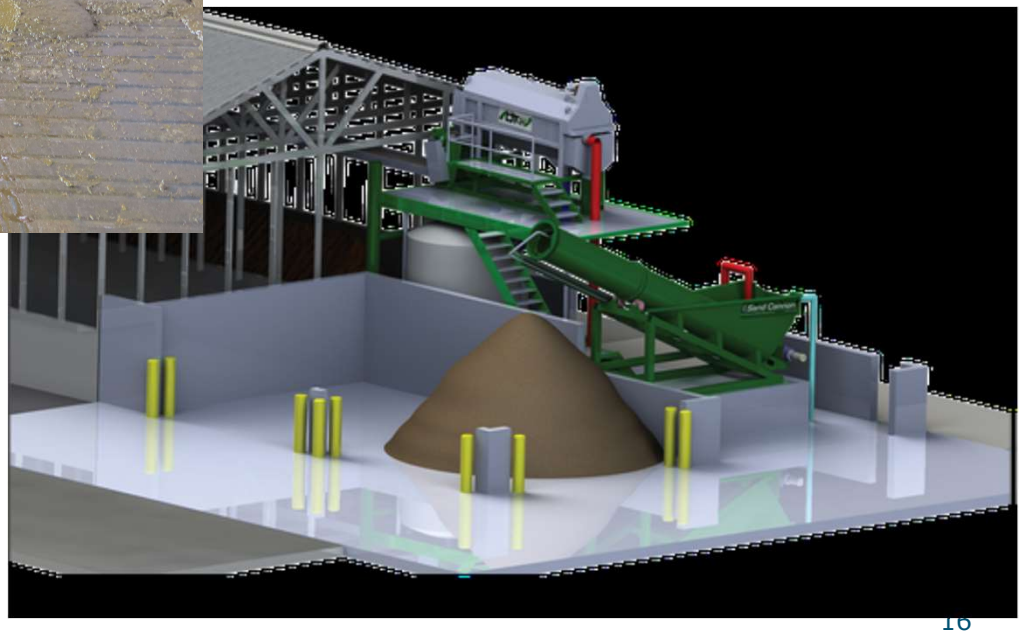

Woodchips bedding


Cowgarden with permeable artificial floor

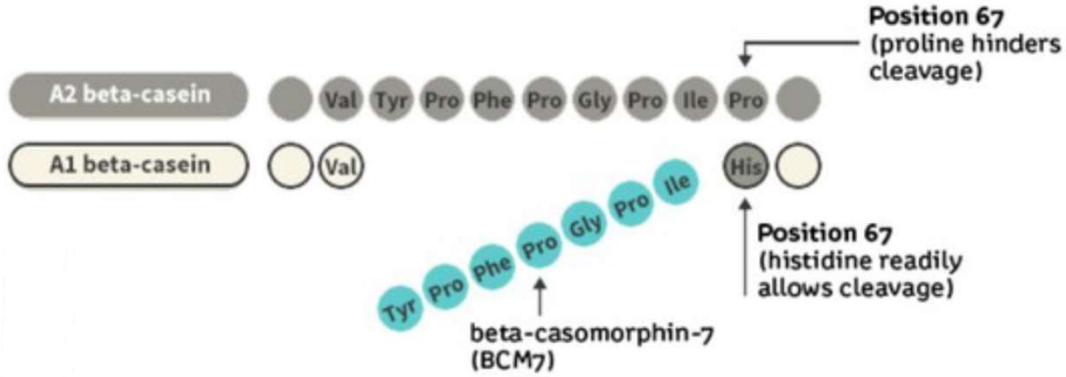
Sand with bedding cleaner


Slovenie

Sand in cubicles



Freewalk cheese and A2 milk



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Oxidation by burning methane or .... capture

Capture, Compress

Filter, Gas pipes

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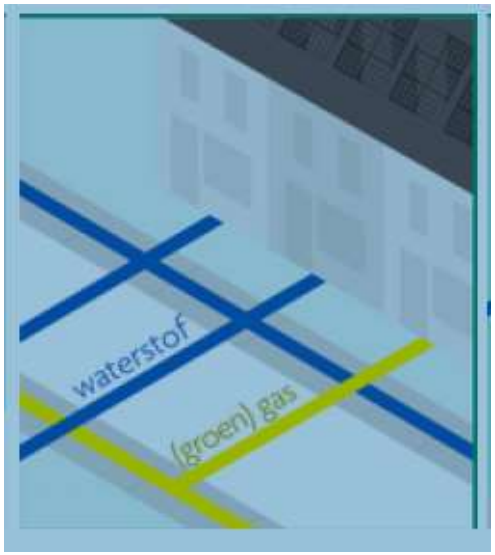
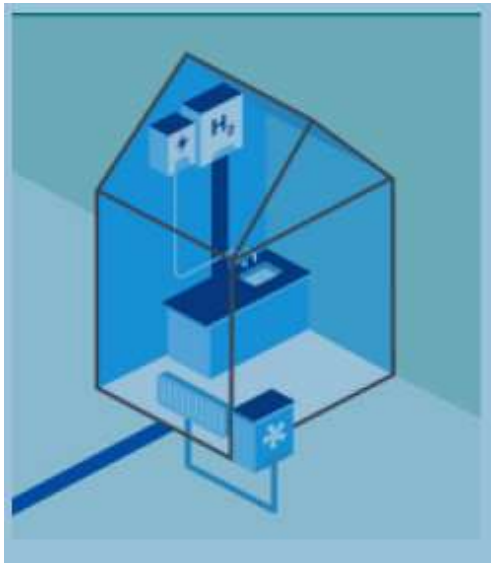
Hydrogen (H2) for 70 neighbours





Hydrogen production:

* Solar panels and windmill
* Electrolyser
* Storage and pressure unit

Double gas network:

* Hydrogen
* Green gas
* Using existing gas network

Homes:

* Insulation up to label B
* Solar panels
* Heat pomp
* Hydrogen boiler

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Innovation centre De Marke

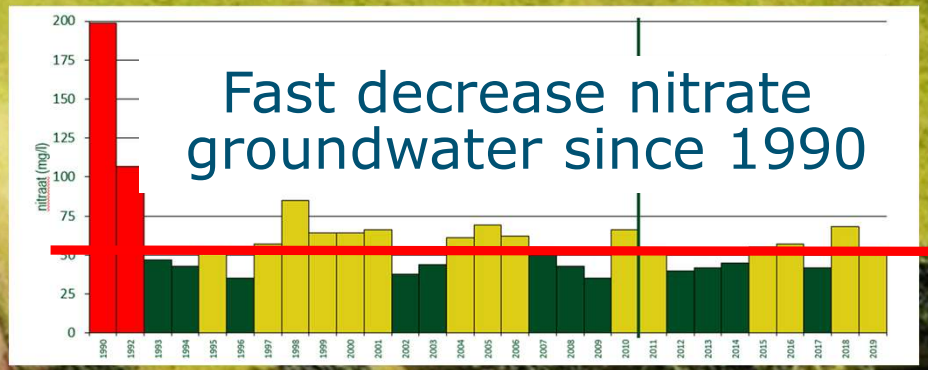
Producing food, energy, eco-services, nature

Digester

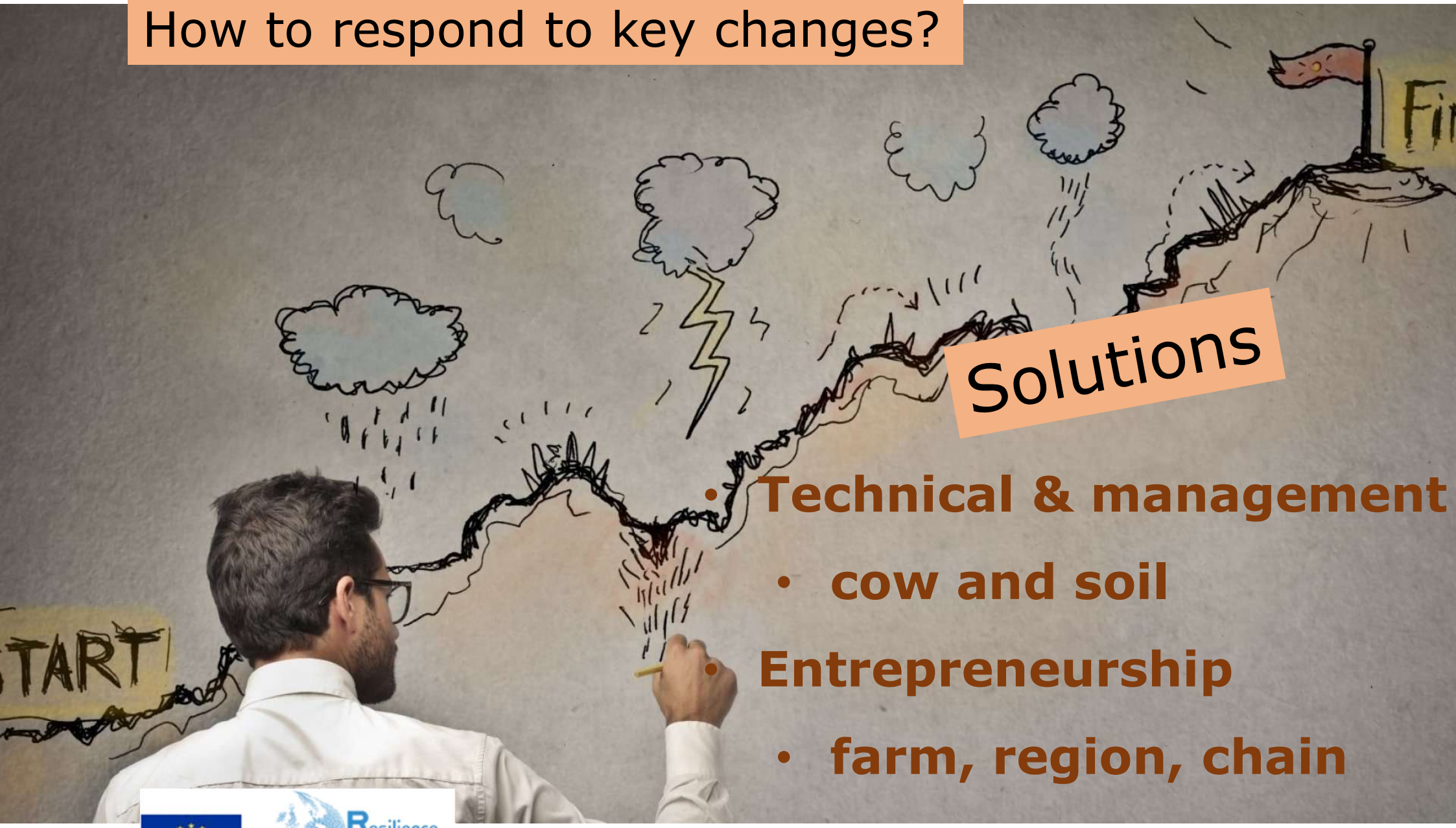
Optimize nutrient cycle

Precision farming

cows and field



How to respond to key changes?



Solutions

- **Technical & management**
  - **cow and soil**
- **Entrepreneurship**
  - **farm, region, chain**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Questions?