



**Knowledge grows**

**Role of the private sector in furthering  
resource-efficient agricultural knowledge  
and innovation systems (AKIS) in Europe**

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- A bit of history ...
- Evolving role of the private sector\*
- Major trends and snapshot examples
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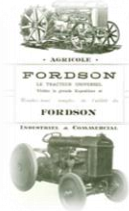


*Image credit: FAO*

\*private sector = agri-food industry + landowners/associations + farmers/associations/coops

# Evolving roles of public and private sectors

Fertilizer trials



Agri –fairs



Conferences



Food processing industry



Knowledge centres



Soil mapping



Agricultural digitalization



National public sector

Private sector

EU public sector

1850

1900

1960

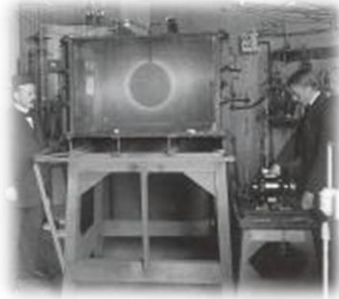
1990

2020

# Yara (Norsk Hydro) 1905: a pioneer of the industrial and agricultural revolution in Norway and beyond



First industrial N-fertilizer  
Calcium Nitrate - 15 % N - 19% Ca



Disruptive innovation:  
Birkeland-Eyde process



Hydropower



Industrial and rural development Telemark region

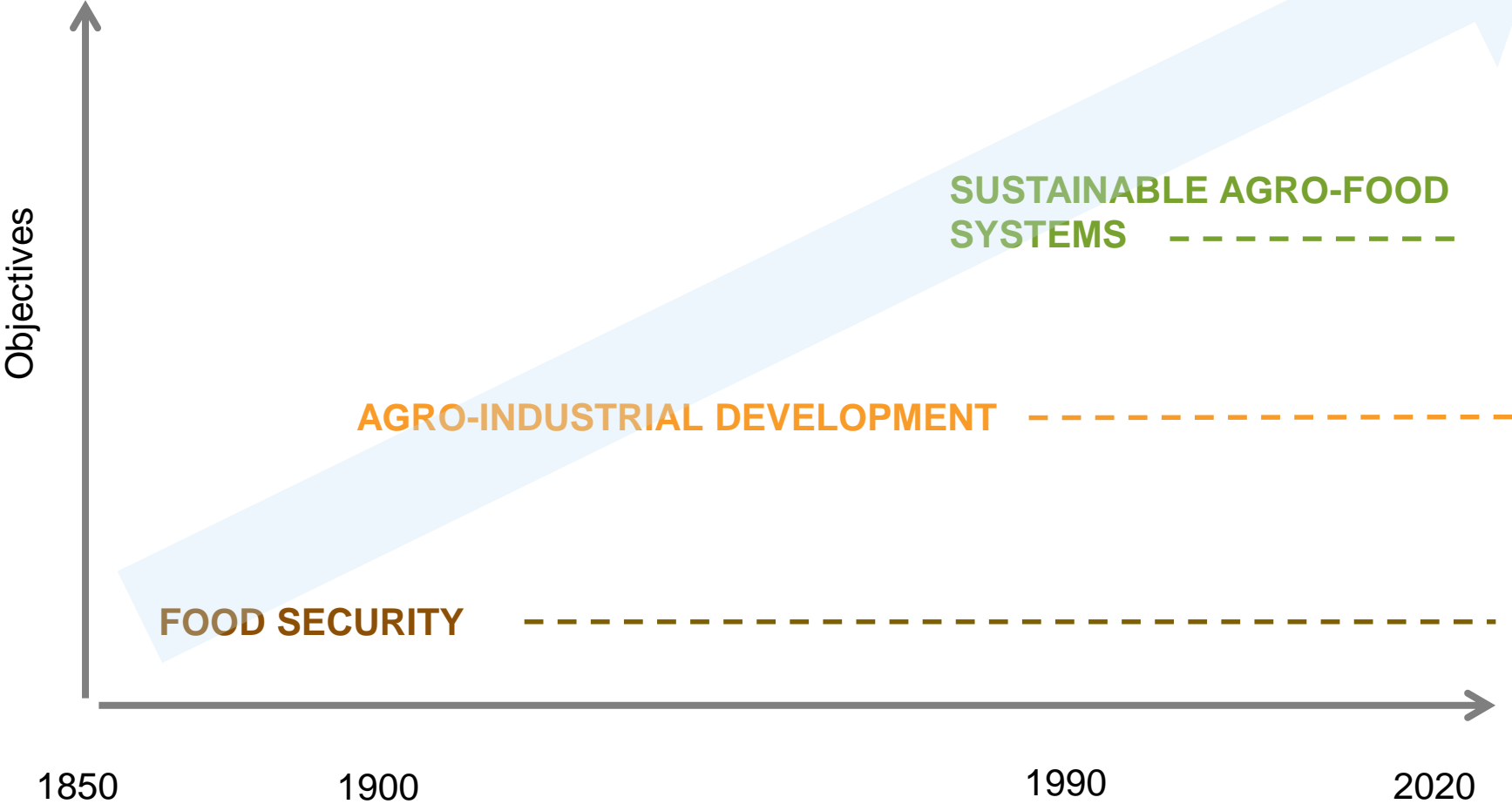
Image credits: [yara.com/about/history](http://yara.com/about/history)

## 21st Century AKIS dynamics



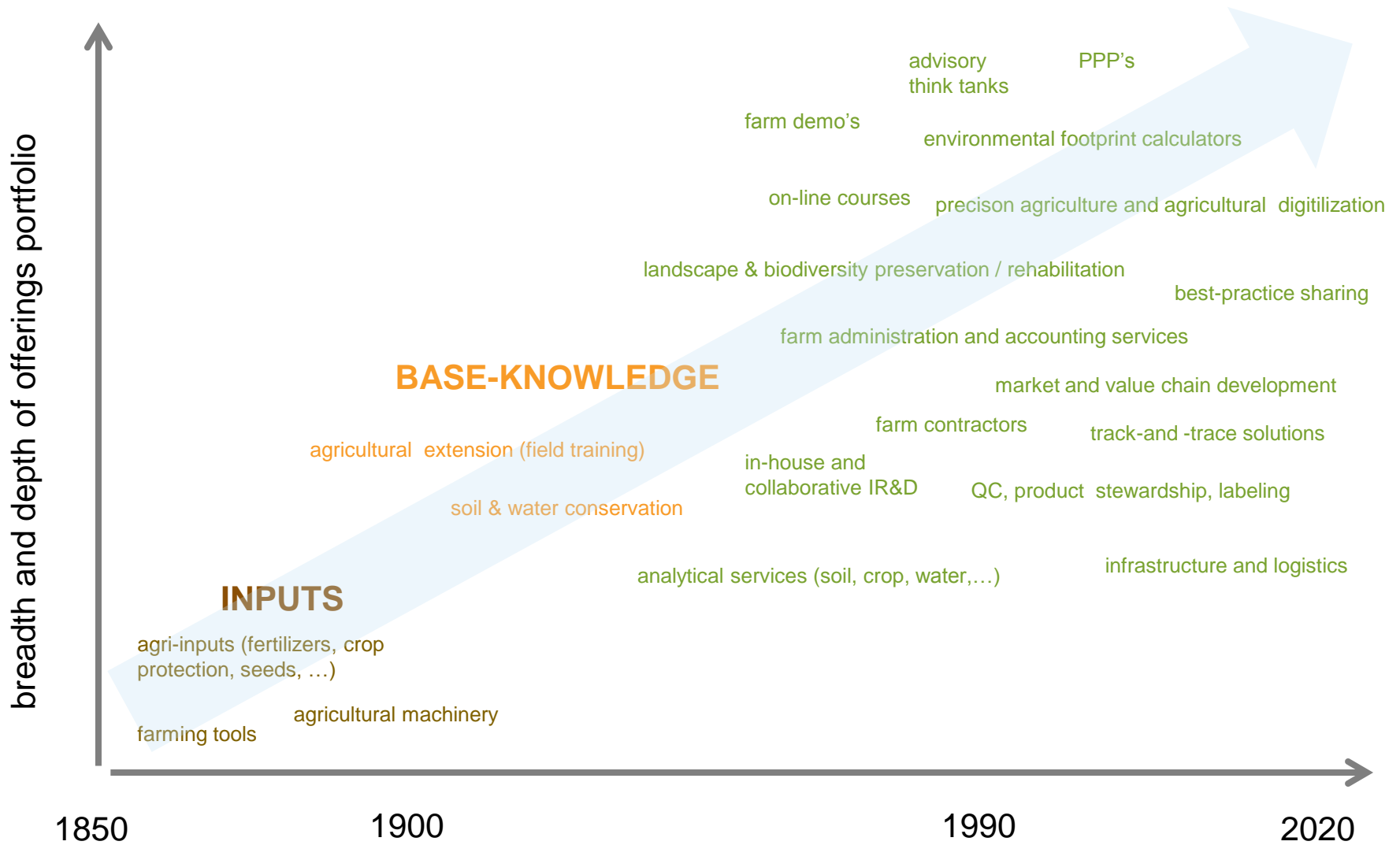
*Image credit: Delta Associates*

# Evolving AKIS key objectives

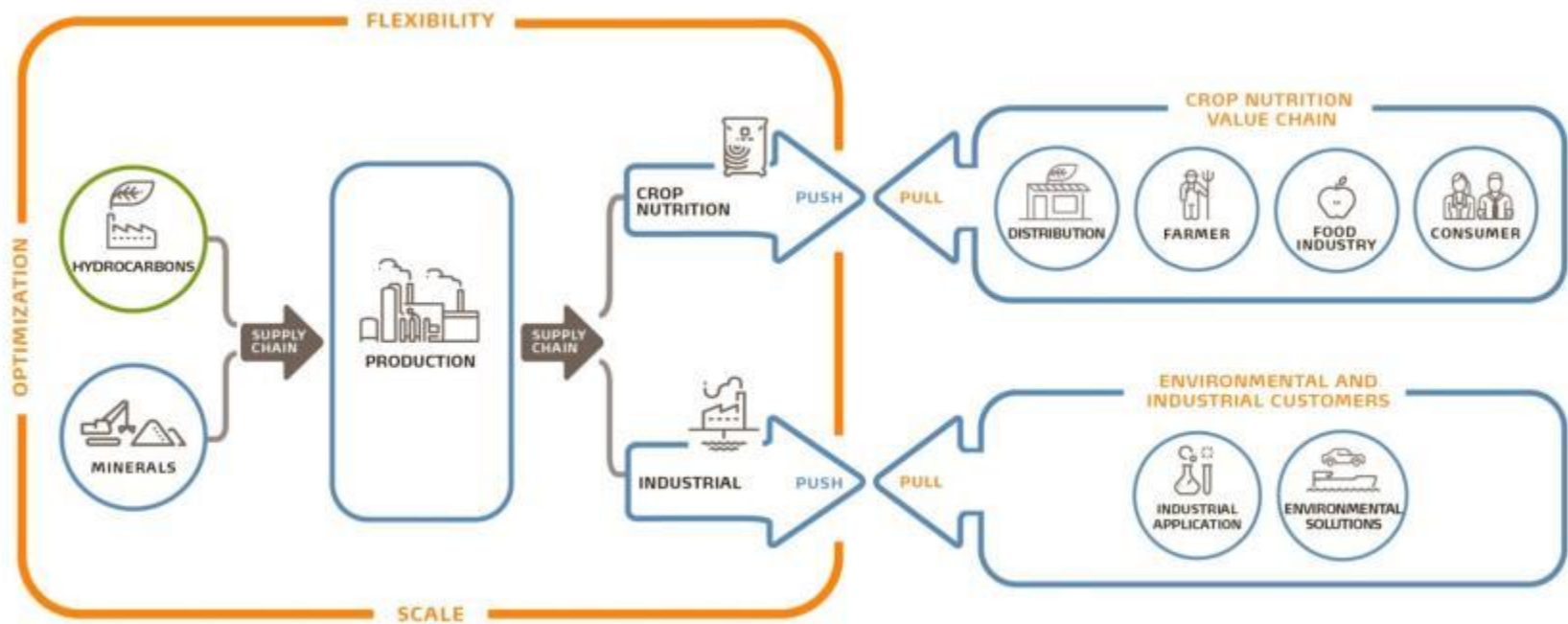


# Evolving private sector AKIS role:

## RESOURCE-EFFICIENT SOLUTIONS & SERVICES



# Yara 2017: a global player committed to sustainable agri-env business solutions





## Selected Yara in-house and collaborative IR&D and extension activities in support of resource-efficient farming

Resource focus (main)	(Long-term) fertilizer trials	Analytical services	Sustainability platforms	Sustainability metrics	NUE, WUE & PA*
Soil	+	+			
Nutrients	+++	+++	+++	++	+++
Carbon	+	+	++	++	
Water	+	+	++	++	++

Legend: +, ++, +++ indicate relative levels of focus (allocation of internal resources)

\*nutrient use efficiency, water use efficiency, and precision agriculture (very wide range of concrete activities)

## Long-term fertilizer trials



Germany



Finland

# Sustainability best-practice sharing farmer platforms



*Image credit: Stichting Veldleeuwerik*

## Examples:



Netherlands



UK



Sweden

## Development and application of sustainability metrics



# Multi-stakeholder sustainability partnerships (eg Cool Farm Tool)



# Precision farming innovation and application



## Yara N-Tester impact in France

- **certified use** basis 240 trials conducted by Arvalis over a 10 year-period
- **in 2016:**
  - used by 21,000 farmers
  - on 70,000 ha wheat
  - 85 kt additional yield (estimate)
  - 70 kt less CO<sub>2</sub>-emissions (estimate)

# Farm visits



**JOHN DEERE**

**YARA**  
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**BAYER**

RESOURCE  
EFFICIENCY THROUGH  
DIGITAL FARMING

**Farm Visits:**  
28 & 29 June 2017

## Online education

# Free online course earns students' praise

*Oslo, April 30, 2015*

The first Yara-sponsored free online course was a great success, attracting more than 3,000 students from 56 countries. The course, offered by the University of Western Australia (UWA), focused on the economics of agriculture, natural resources and the environment.



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**



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# AKIS support in emerging countries

## Yara Ghana and USAID organize Training for Field Staff

The participants were further taken through various methods of soil sampling and how to determine the nutrient deficiency and how to amend the soil to correct it.

Published: 30.11.2015 Pulse Staff

[Print](#) [eMail](#)



Yara Ghana and USAID organize Training for Field Staff

- crop nutrition basic education
- 130 demo trials (maize & rice)
- soil and foliar analysis
- 13,000 farmers reached

## Conclusions:

**Knowledge** is a **key resource** to support European agriculture in meeting 21<sup>th</sup> century challenges, and the private sector plays a vital role in advancing, sharing and implementing this knowledge.

**CHALLENGES:** climate change and resource depletion; food safety; health; political and economical uncertainty; international competition, regulatory pressure, complexity, and coherence; budgetary and investment constraints; EU regional disparities; smallholder farms; ageing farm population

## OPPORTUNITIES

- Recognize and leverage the knowledge and expertise from the private sector.
- Stimulate PPP initiatives - cfr EU international development approach, COM(2014)263
- CAP greening:
  - more support for precision farming adoption;
  - certification of practice-proven precision farming tools;
  - allow flexibility to choose from a wide range of options, adapted to local conditions.
- Exchange and use of (aggregated) big data for farming performance improvement and policy-impact monitoring.
- On-line training programs to attract and support a new generation of farmers.