CHALLENGES FACING THE EUROPEAN FERTILISER INDUSTRY

AND THE RESPONSE OF INDUSTRY IN ADDRESSING THESE CHALLENGES
INTRODUCTION

- Challenges are varied and complex
- Present on multiple levels
- Some specific to EU context, while others are more general to the international scenario
  - Active in global trade flows & full exposure to global market forces
GLOBAL CONSIDERATIONS

- Biggest challenge: structural overcapacity of the market (IFA, 2017)
- Ongoing expansion projects to ↑ capacity
  - Capacity growth in all segments are expected: nitrogen, +7%; phosphate rock, +10%; potash, +20% from now to 2020 – IFA, 2017
- Persistent oversupply
- Coupled with a regional weakening demand
  - Contingent on low crop prices, unfavourable public policy & sub-optimum growing conditions
- ↑ Global demand
  - 1.3% year on year growth to 200 million tons by 2020
  - Regional growth only
    - Premise of growth based on macro demographic principles
MACRO DEMOGRAPHIC PREMISE

2,750 kcal/per capita per day

3,130 kcal/per capita per day

+13.8%
MACRO DEMOGRAPHIC TRENDS


Median age (years)

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<th>Country</th>
<th>2010</th>
<th>Changes in median age</th>
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LAND USE IN AGRICULTURE EU-28

Land use in agriculture between 2000 – 2015 in the EU-28

- No data for Bulgaria in 2005; no data for Italy in 2009
- Data source: Eurostat

Percentage decrease in agricultural area from 2000 – 2012 in the EU-28
FERTILISER CONSUMPTION TRENDS

Estimated consumption of mineral fertilisers in agriculture in the EU-28 (2006-2015, million tons of nutrients)

- Slowing enlargement, less accession funds & standard EU policy
- Commodity fertiliser consumption will remain constant/decrease

Source: Eurostat, 2016
ACCESS TO RAW MATERIALS

- Raw materials constitute 80% of production costs in manufacturing of commodity fertilizers
- EU characterised by many smaller manufacturers
  - Lack economies of scale to integrate to upstream activities
  - Purchases made through contract-based pricing: affected by ↑ price, price volatility & delicate geopolitics
- Unfavourable policies lead to ↑ in production costs
  - Difficult to relay costs to end-user
- While extra-EU manufacturers benefit from local feedstocks & favourable policy
  - Drive opening of new extra-EU manufacturing facilities & export hubs
- EU competitiveness could be further compromised
ACCESS TO RAW MATERIALS – PHOSPHATE ROCK

- No significant reserves in EU = high dependence on foreign imports for manufacturing of phosphate fertilizers
  - Availability subject to price volatility, supply disruptions & geopolitical scenarios
- Risk of supply disruptions can be caused by:
  - Concentration of reserves
  - ↑ Oligopolistic/monopolistic trends
  - Political turmoil
  - ↑ Reliance on Moroccan imports
- Vertical integration of P supply chains
  - Supply of finished products rather than raw materials
- Listed as ‘critical raw material for the EU’
EU PUBLIC POLICY AND DIRECTIVES

- Additional challenge: a complex set of public policies that aim to promote accountability and sustainability in the industry.

- Comprehensive set of directives and legislations aimed to protect natural resources and reduce the impact of industry on the environment.

- The agriculture industry is a major polluter & cause of environmental degradation in the EU.
  - This industry is often at the forefront of these policies.
NITRATES DIRECTIVE (1991) (ND)

- The main policy tool to ↓ N leaching from agriculture
- Member States (MS) must identify Nitrate Vulnerable Zones (NVZ)
- In some MS, the whole territory is designated as a NVZ
- NVZ is subject to mandatory national action plans
- Action plans can vary between member states
- Action plan measures can include:
  - N ceilings, restrictions on timing of application, sloping hills & wet conditions, additional buffer strips near water courses & balanced nutrition requirements
- Measures significantly ↓ applications of N fertilizers in agriculture

Annual average river nitrate concentration (mg/l NO3-N) in 2008, averaged by river basin district (Source: European Commission 2013)
FROM A POLICY PERSPECTIVE: THE EC HAS PLACED A HARD CEILING ON NITROGEN – NO MORE NITROGEN
WATER FRAMEWORK DIRECTIVE (2000) WFD

- Main policy tool to establish a good status of surface waters in EU
- Requirements on water quality with indicators for chemical status
  - Nutrients must not exceed a threshold concentration
- Concentration of nitrates from agriculture in water is an integral part of WFD
  - Threshold concentrations provided for N & P
- Goals & measures of the WFD overlap with and support the ND
CAP: COMMON AGRICULTURAL POLICY

- 40% of the EU budget & functions to support a viable EU ag-industry
- Recently, backing EU directives on environment & sustainability is a significant CAP element
- Supports congruent ag-practice at farm-gate & regional scale through 'green funding' mechanisms
  - Wider buffer strips for watercourses is an agri-environmental measure under the Nitrates Directive = Farmers are eligible for CAP payments
  - CAP ‘Cross Compliance Principal’: compensation for ↓ income for complying with EU policy
- Direct payments for providing agri-environmental services
  - e.g. Designating farmland as an ecological focus sites

Public policy is financing mechanisms that↓ production activities, ↓ land used in agriculture & ↓ use of fertilizers
OTHER RELEVANT DIRECTIVES

- Not specifically related to agriculture but affect the industry:
  - ‘The Industrial Emissions Directive’ (2010/75/EU)’ on regulating polluting emissions from industry
    - Nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO2), ammonia (NH3) & fine particulate matter (PM2.5)
    - E.g. manufacturer requirement for energy audits in manufacturing processes to identify target points for energy savings
OUTCOMES OF DIRECTIVES

- Strong case for how directives are shaping and will continue to shape the fertiliser industry
- Some argue public policy is the most important factor limiting the growth of the industry

Public policy is pushing towards a ↓ consumption of fertiliser, while ↑ the costs of manufacturing through full pricing mechanisms internalizing the external costs on environment & sustainability

This is not working in favour of an industry struggling with growth & profitability
NEED FOR CHANGE

- Reconsider traditional dogma: ‘maximizing inputs to maximise plant yields’
  - Clearly no longer a viable approach
- Shift in focus away from ‘maximising inputs’ towards ‘optimizing inputs’
- This change represents a limit for growth by placing a cap on the use of inputs
FROM CHALLENGES TO OPPORTUNITIES

- It is in exploring and adapting to this change that EU fertiliser industry can find new pockets of opportunity
  - Change in products
  - Change in processes & raw materials
  - Change in grower
  - Change in legal frameworks
CHANGE IN PRODUCTS

- Shift from commodity fertilizers → differentiated specialty fertilizers
  - **Specialty N-based products**
    - Offer value-added products that optimize & manage N in soil
      - E.g. Slow release, urease-inhibitors, foliars, amino acids/seaweeds
  - **Specialty micro-element mixes**
    - Positioned to ↑ NUE micro- & mesoelements
  - **Increased focus on soil-specialties & soil conditioners**
    - Positioned to optimize NUE, root function & nutrient absorption
  - **Biostimulants & biofertilizers**
    - ↑ Plant efficiency, independent of nutritive element
    - ↑ Supply & availability of nutrients in the soil without adding more nutrients
    - Next blockbuster product segment – PiperJaffray, 2015
CHANGE IN PROCESSES & RAW MATERIALS

Significant opportunities for new sources of phosphorous

- Interest in manure processing for alternative high efficiency P fertilizers
  - Process innovation in solid-liquid separation, drying, composting, membrane filtration & biological treatments
  - CAP-funded group projects and trial cooperative installations
- Industry driving innovation in:
  - ↑ Efficiency of phosphate-rock processing
  - P recycling & alternative P raw materials
  - Industry targets to replace up to 15% of phosphate rock inputs with P recovered from sewage, sludge, ash & other source
EU manufacturers are not well-positioned to compete on the global commodities market

Differentiated specialty products:
- Create a more resilient EU fertiliser industry
- Price premiums & higher margins
- Alternative raw materials
  - Buffers incidence costs & price volatility of raw materials
- The SME (typical of the EU market) can find profitability in this business model

Result: ↑ offering of specialty products
CHANGE IN GROWER

- Growers ↑ willingness to pay a premium price on specialties
- Perceived to have added-value & increasingly favourable cost:benefit ratio
- Why?
  - N ceilings are real - legitimate interest in products that ↑ NUE
  - Clear monetary incentives
  - ↑ Importance of soil care & soil health – soil is considered a farm asset that needs to be managed
  - Responsiveness to the organic market segment
GROWTH IN ORGANIC FARMLAND IN EU-28 AND EUROPE

Figure 15: Growth of organic farmland in Europe, 1985-2014

Source: Lampkin, Nic, FiBL-AMI surveys 2006-2016 and OrganicDataNetwork surveys 2013-2015
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  - Responsive to the organic market segment
  - Must ↑ yield per unit area - investing in irrigation & fertigation systems
    - Requires the use of specialty fertiliser products: WSF, NPK water solubles, etc.
  - Strong tendency for protected agriculture, greenhouses & high density greenhouses
    - Requires specialty fertilisers & precision/dig-agriculture
Protected agriculture systems in the Westlands, Netherlands.
• Closed hydroponics, aquaponics, & vertical farming
• New systems will require new specialty products & specialized methods of application
• ↑ Relevance of precision agriculture - more specifically precision nutrition
• Use of digital technologies for nutrient management will become essential
On the other end of the spectrum in large-scale extensive production: precision agriculture/dig-ag will become increasingly relevant to reduce and optimize use of fertilizers & other inputs.
Emergence of new processes, products, raw materials & production systems

Current EU fertiliser regulation (EC No. 2003/2003) does not support in bringing these new solutions to market

- Narrow definition of fertiliser addresses the use of mainly mineral chemical fertilizers - only 50% products on EU market
- Specialties, such as soil improvers, biostimulants & biofertilizers, are not accommodated in this legislation
- In 2010, EC recognized the limits framework imposed on industry & embarked on revisions to EC 2003/2003
- In 2015, revisions were fast tracked by inclusion in new circular economy package
A circular economy is based on sharing, leasing re-using & recycling in a closed loop, reducing waste to a minimum.

- EU policy objectives for moving towards circular economy: ↓ pressure on the environment, security in raw materials, competitiveness, innovation & sustainable economic growth

- Initially fertilizers were not included in the original action plan

- In 2015, fertilizers were included in the final package
  - Revisions to EU fertiliser framework were identified as a priority action

**From a Linear Economy...**

**...to a Circular Economy**
NEW LEGISLATIVE FRAMEWORK (NLF)

- Innovative hybrid building-block legal model
  - Product placement in 2 categories: Component material & product function category
- Many advantages to support the industry
  - Accommodates a wider range of fertilizers
  - Easy registering of innovative products
  - Explicitly includes innovative fertiliser product segments
    - E.g. biostimulants
  - Supports production from new & domestic raw materials
- Revisions driven by the need to address most pressing industry challenges
OUTCOMES OF NLF

- A single harmonised EU fertiliser market
- Promote product differentiation & innovation
- Access to & use of new domestic raw materials
- Supply chain resilience
- Enabling regulatory environment to support in the transition towards a more competitive, resilient & sustainable EU fertiliser industry
IN SUMMARY: THE EU FERTILISER INDUSTRY IS IN A STATE OF FLUX

- Unfavorable demographics, weakened demand, access to raw materials, increased environmental costing – in response: innovation-driven differentiation to specialty fertilizers products & nutrition solutions
- In this context, we see directives as key drivers of this change
  - Posing the some of the key limitations to industry: through sustainability directives
  - But providing also new opportunities: through a financing mechanisms & revised enabling legal frameworks

*Whether this will be enough to maintain and growth and competitiveness of the EU fertiliser industry, remains to be seen*
THANK YOU FOR YOUR ATTENTION