BG2.Policy Linkages: What are the priority measures needed for better nitrogen management that should be included in models?

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BG2.Policy Linkages

- Context and scope of the work
- Key Actions in the nitrogen cycle
- Important Factors
  - Nitrogen cycle and real world application
  - Modelling Considerations
- Developing Selection Criteria for Priority Measures
- Specific measures by sector and key action
- What do we want to achieve in the working group?

Context and scope - 1

Establish a **framework for the international model chain** that will be needed for the science-policy support process of the 'International Nitrogen Management System'.

What are the **priority measures** needed for better nitrogen management that should be included in models?

Needs of international conventions and policy makers

Demonstrate how feasible improvements in N management translate into quantified co-benefits

WP2: Develop global framework of the priority N-related issues to be linked

Context and scope - 2

- Consider : 'Priority Measures' - 'Current Measures' – reflect on modelling needs - outcomes to the policy community for reflection

- Terminology
  - Measures represent **actions for change** made by different business sectors or parts of society. These interact with **facilitating actions** to achieve change. Such facilitating actions may include a range of different **policy instruments** (e.g. incentives, levies, regulations, technical support).

- Timescale (progress in the present, plan for the future)
  - 2yrs, 5yrs, 10yrs

Key Actions
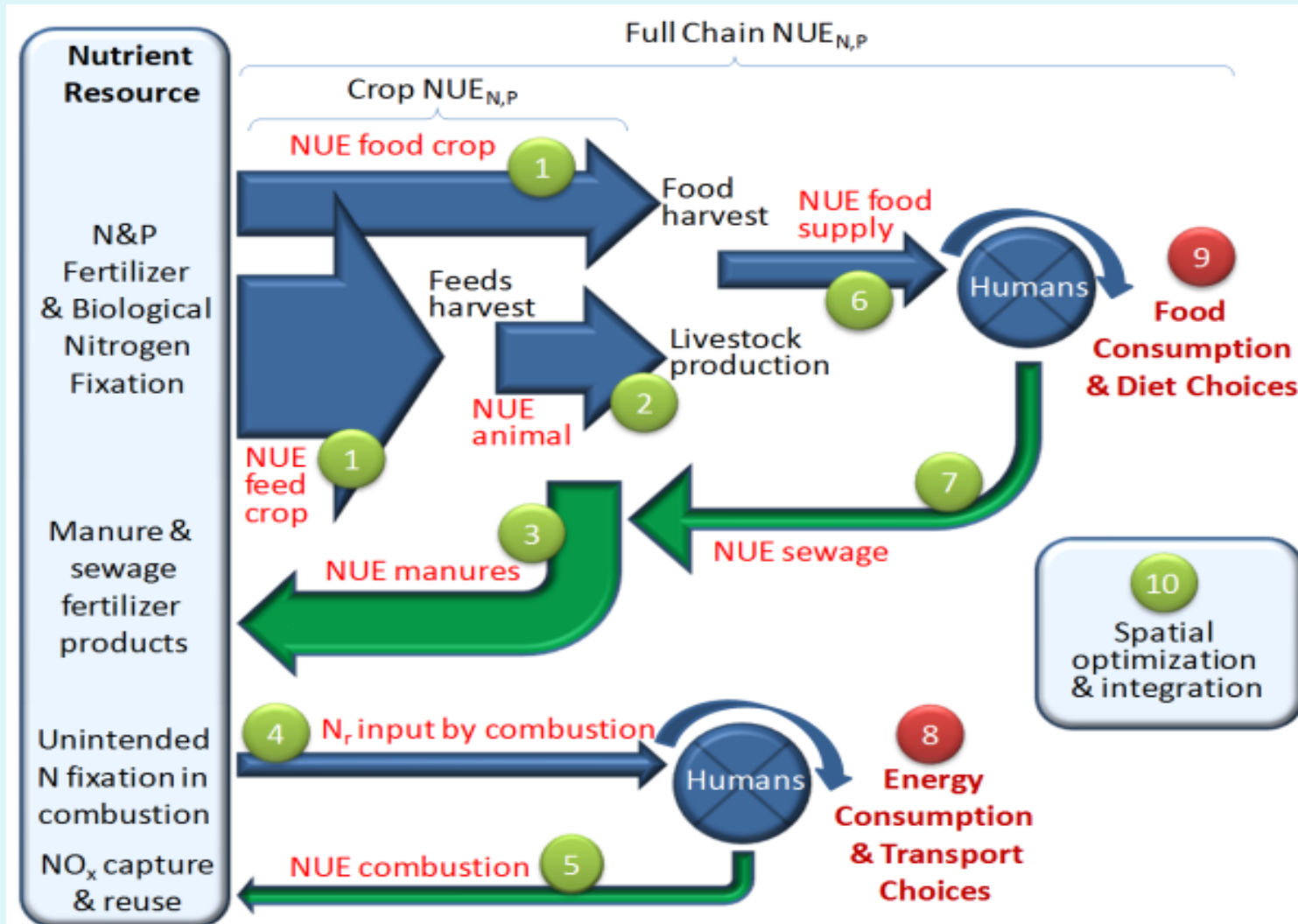
Nitrogen use

Recycling

Motors of human use

Key Action

Developing a framework - 'Key Actions' supported by 'Overall Measures'

Agriculture

NUE: crop production

- Improvements in fertiliser and manure storage and application.

NUE: animal production

- NUE improvements in
  - Farm level N management
  - Feeding strategies
  - Animal breeding
  - Animal Housing

Increasing the fertilizer use equivalence value of manure

- Improvements in fertiliser and manure storage and application.

Transport and Industry

Low-emission combustion and energy efficient systems, including renewable resources

- Innovation and regulation in low-emission combustion technologies
- Greater use of renewable energy sources

Development of NO_x capture and utilization technology

- Innovation and application of new technology with potential for pre-market green finance support

Waste

Improving nitrogen efficiency in fertilizer and food supply (reducing supply chain waste) and reducing food waste

- Management systems to reduce post harvest losses.
- Reducing waste in the food production sector.
- Strategic planning at local/regional level
- Technological advances

Recycling nitrogen from waste water systems, in cities, agriculture and industry

- Technological advances
- Strategic planning at local/regional level
- Incorporation into waste water investment programmes.

Societal Consumption Patterns

Spatial and temporal optimization of nutrient flows

- Technological advances
- Strategic planning at local/regional level

Optimisation and Integration

Energy and transport saving

- Energy saving policies
- Alternative transport systems
- Technological advances

Lowering personal consumption of animal protein among populations consuming high rates (avoiding excess and voluntary reduction)

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Important factors

**Nitrogen cycle and real world application**

- Contribution to improving NUE (which can be measured in a variety of ways)
- Cost-benefit (measured against pollutant)
- Overall (or outlay) costs
- Reproducibility (i.e. in a real world setting or in a variety of settings)
- Possibility of monitoring and measuring the efficiency improvements for general study or policy implementation/enforcement
- Time to market (i.e. is the measure part of existing technology or is significant development still required)?
- Scale of applicability (i.e. wide or specialised)
- Incorporated into a current policy framework
- Co-benefits (or trade-offs) with other pollutants
- Implications/importance of the measures for the different INMS regions

Important factors

Modelling Considerations

- Availability of data to assess the measure
- Spatial resolution of the measure
- Temporal resolution
- Model type - i.e. process based or empirical
- Model compatibility (either technically or due to original model type or construction)

Developing Criteria for Prioritisation

Business

Scale

Factors

Factors

Social Factors

Policy

Factors

Science

Factors
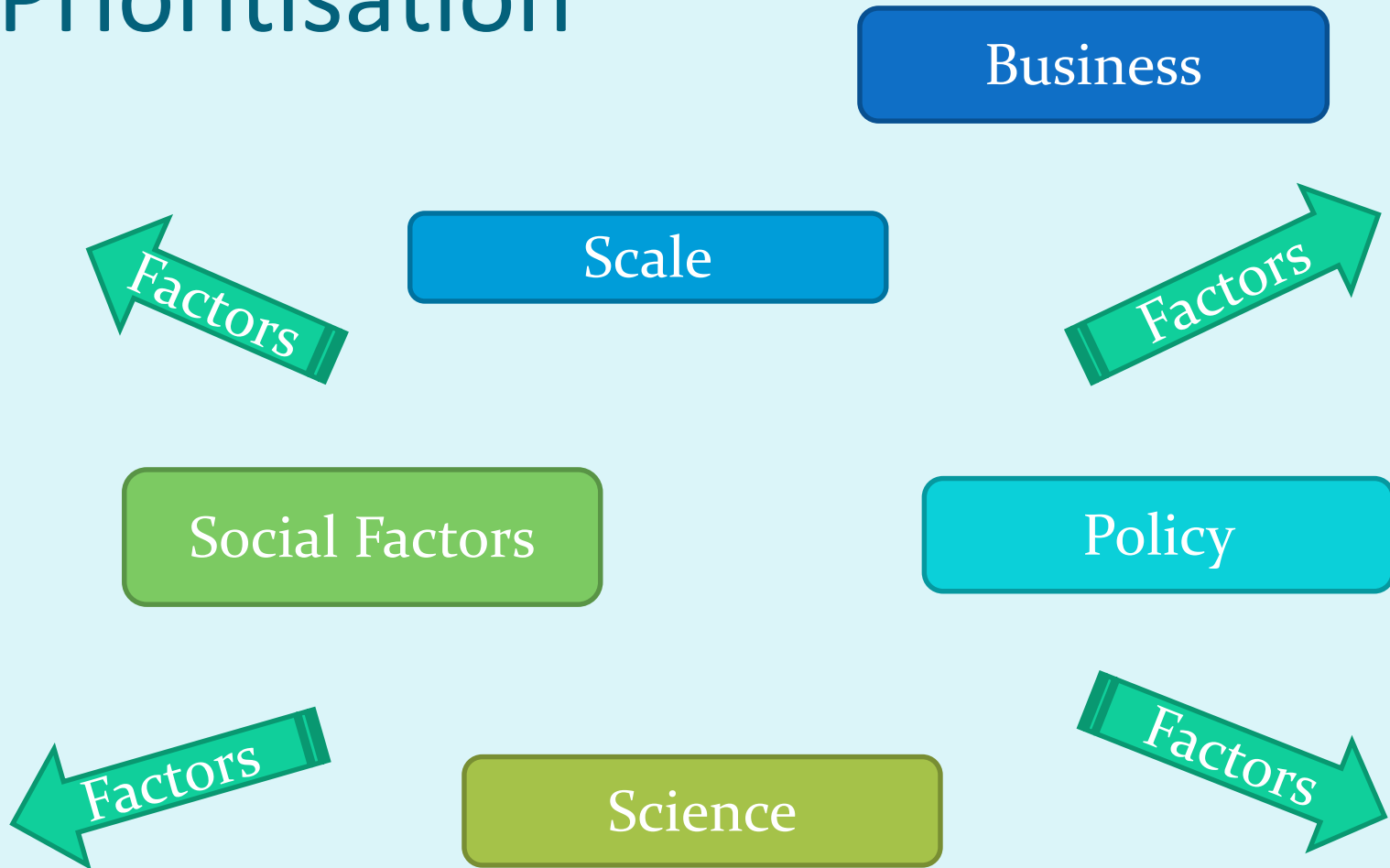
Specific Measures - examples

Agriculture

Improving NUE in crop production

- Implementation of the '4R Nutrient Management Stewardship' approach (i.e. Right fertiliser, Right amount, Right time, Right Approach)

Transport and Industry

Low-emission combustion and energy efficient systems, including renewable resources

- Develop primary measures to reduce NO_x and other N_r emissions per unit of combustion, such as low-NO_x burners reducing NO_x formation.

Waste and Recycling

Improving nutrient efficiency in fertilizer and food supply and reducing food waste

- Reducing food wastage during production, distribution, processing and consumption

What do we want to achieve in the working group?

Intermediate questions

- What **criteria** should we use to help identify priority measures for better nitrogen management?

- Could a **short proposal** of such common criteria be developed as a basis for reaction by policy makers?

- Should we use **ranking** based on threats and benefits/co-benefits of pollutants or is relative cost-benefit needed?

- What **importance** should **current policy frameworks/targets** have on the measures we choose or should the approach be equally open to future aspirational measures?

- Is there a particular **target number of priority measures** to which we limit ourselves in modelling capability for each time period, 2, 5, 10 years?

- Should we **consider different groups of measures** for the different INMS **demonstration regions**?

- If you were to make a "**Nitrogen Top 10**" of measures to manage nitrogen better. What criteria would you set, and what would be on your list?

What do we want to achieve in the working group?

Overarching questions

- In the context of providing global food security, without adverse nutrient related impacts; What would be the **priority measures** to be incorporated into nitrogen IAM over different timescales?

- Suggested priority measures to include in the short-term (**2 years**)

- Suggested priority measures to include in the medium term (**5 years**)

- Suggested measures to include in the long term (**10 years**)

Other items to consider....

- To what extent can global measures be identified versus specific options for different regions?
- Cross-cutting issues, such as data needs.
- Potential output from the meeting

'Key Actions' by sector	Primary Pollutants Addressed*	Priority measures	Included now (or soon)	Relevance to INMS regions ###*	Priority measures short-term (2yr)	Technical difficulty & Cost ???, $$$**	Priority measures long-term (5yr)	Technical difficulty & Cost ???, $$$**	Model systems