Towards INMS

International Nitrogen Management System & WMO-GAW cooperation

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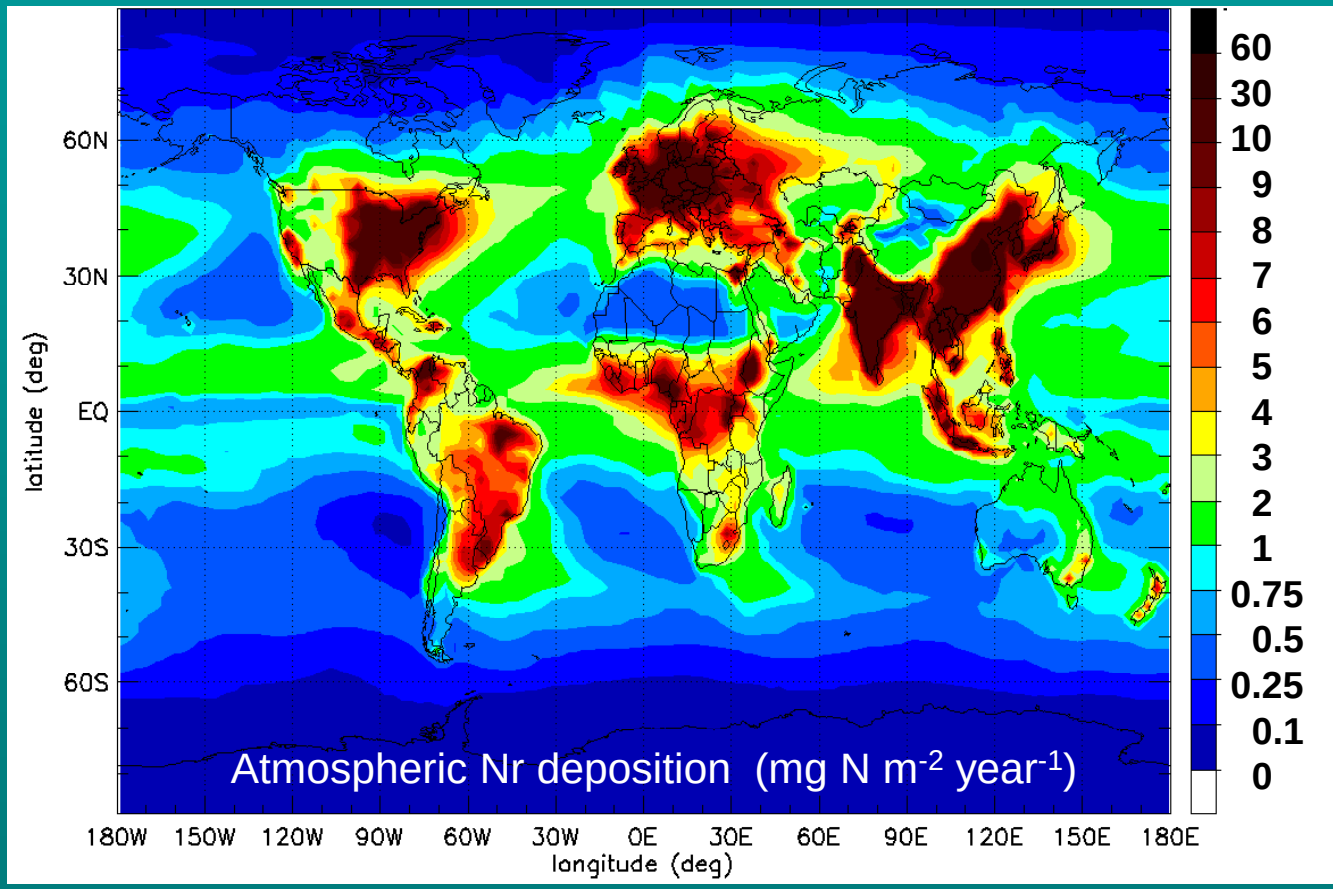
TFIAM 45
Lisboa, Portugal
May 2016

Global N_r production & dispersion

Human N_r Production:
(Tg yr^{-1})
1860: 15
1995: 156
2005: 191

2005 sources:
Haber Bosch: 120
Biol N fixn: 50
NO_x emission: 40



Galloway et al. *Science*

The European Nitrogen Assessment

Sources, Effects and Policy Perspectives

Edited by

Mark A. Sutton

Clare M. Howard

Jan Willem Erisman

Gilles Billen

Albert Bleeker

Peringe Grennfelt

Hans van Grinsven

Bruna Grizzetti

CAMBRIDGE

COMMENT

ENVIRONMENT ... Deer...

BIOTECHNOLOGY Biohackers take biology into the garage p.167

ECOLOGY Libyan revolution might protect bluefin tu... with trawlers ground... ... Meer, ...

Vervuiling met stikstof kost miljarden

Nitrogen taint alert

Warning over nitrogen footprint

Pollution à l'azote : une lourde facture pour l'Europe

...isely than this would be cleaner, reduce odour and emit less ammonia.

Too much of a good thing

Curbing nitrogen emissions is a central environmental challenge for the twenty-first century, argue **Mark Sutton** and his colleagues.

Nature 14 April 2011

Farming

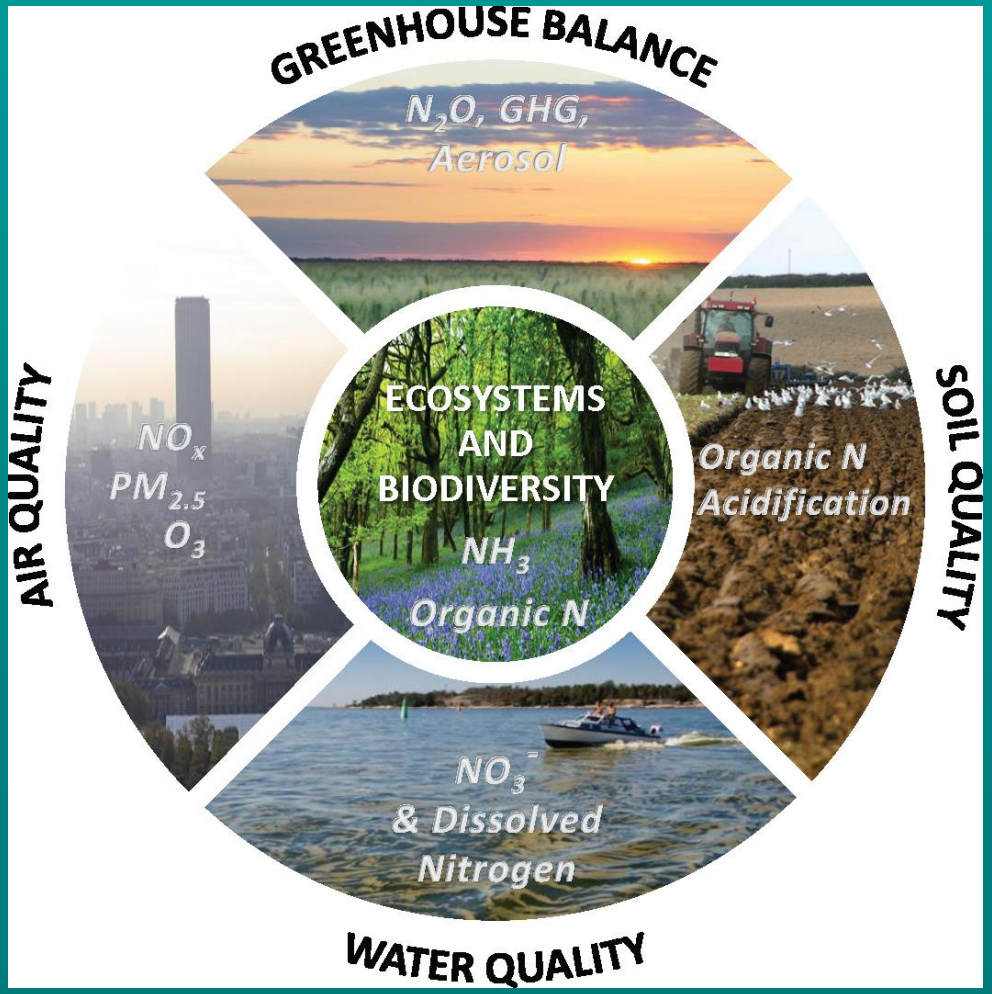
Union defends use of nitrogen in high-octane climate change debate

www.nine-esf.org/ENA

The five key threats of excess Nitrogen

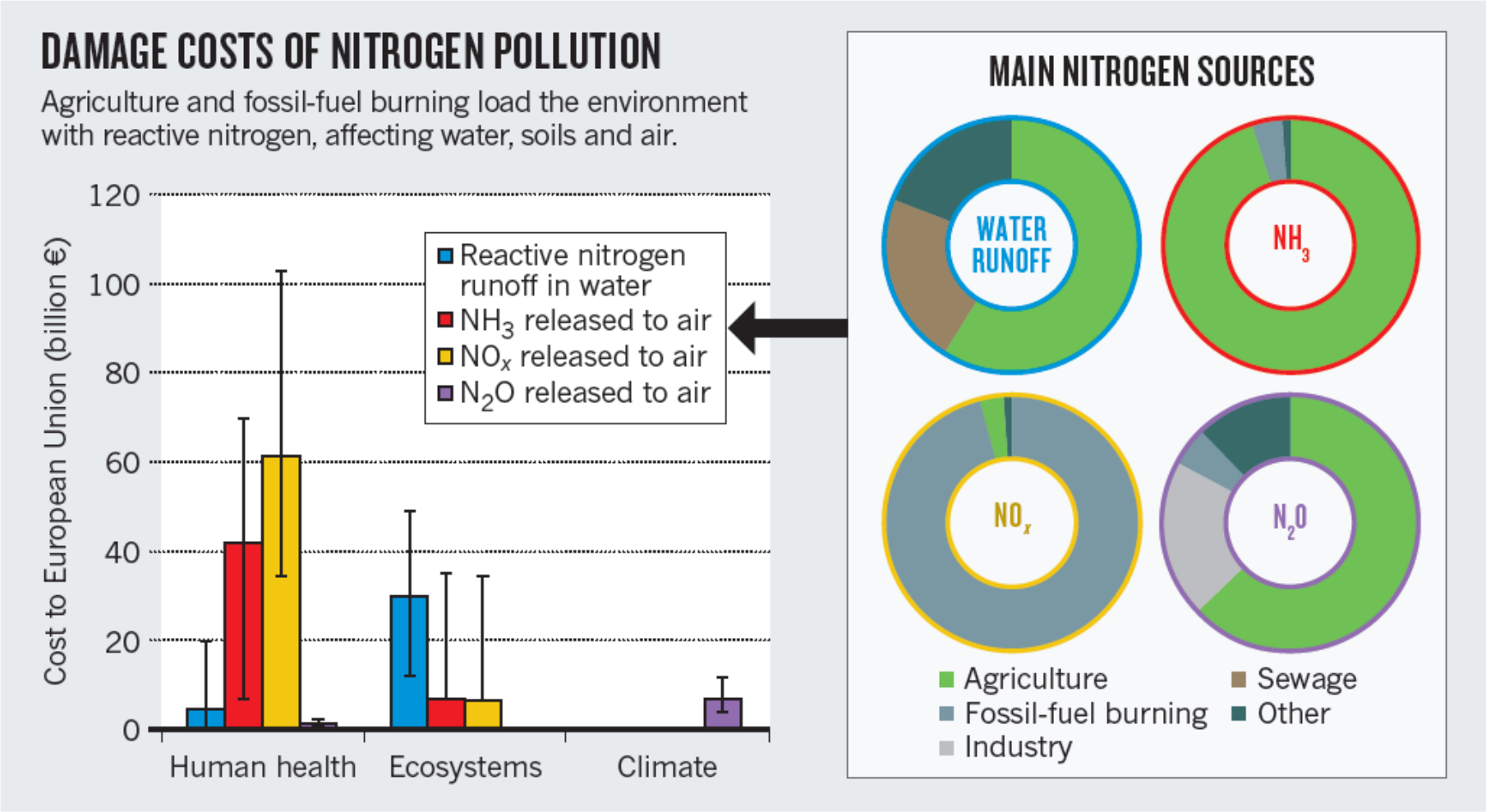
The WAGES of too much nitrogen

Water quality
Air quality
Greenhouse balance
Ecosystems
Soil quality



With thanks to Empedocles

Nitrogen Damage Costs & Sources

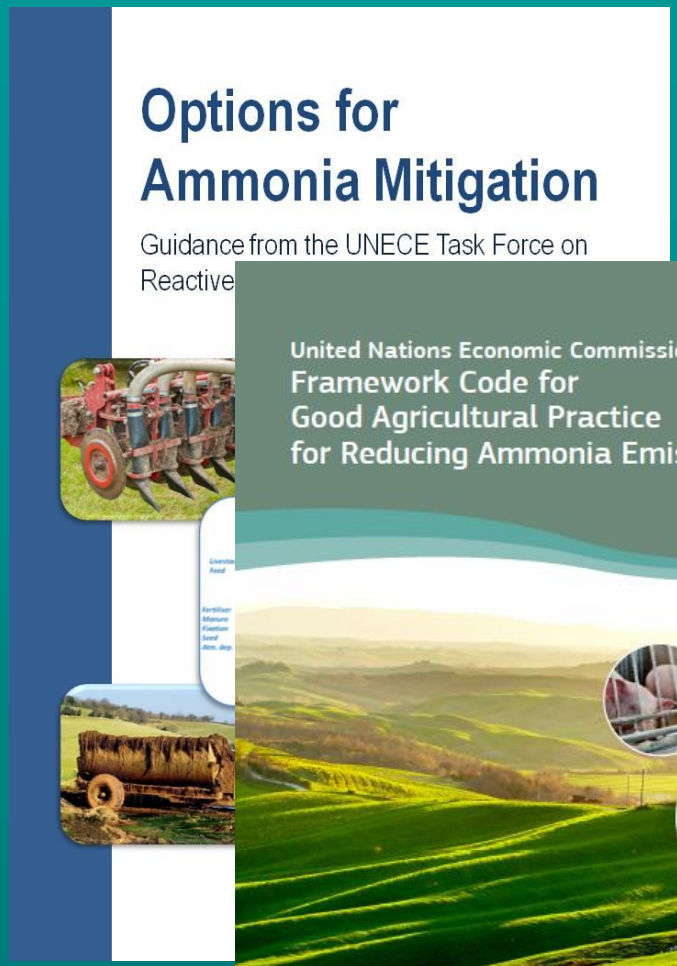


EU Damage cost: 70 - 320 billion € / year

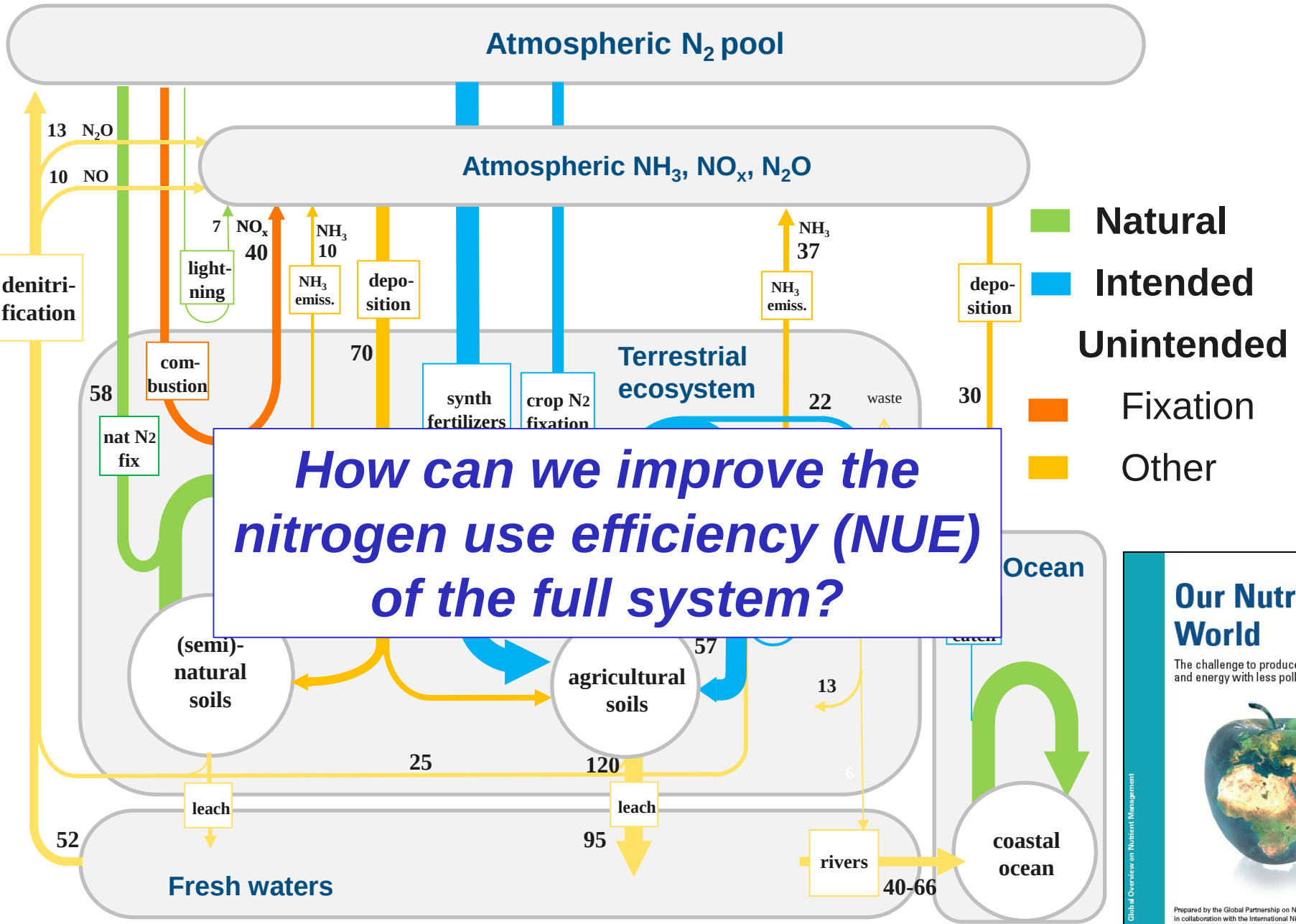
Nature 14 April 2011

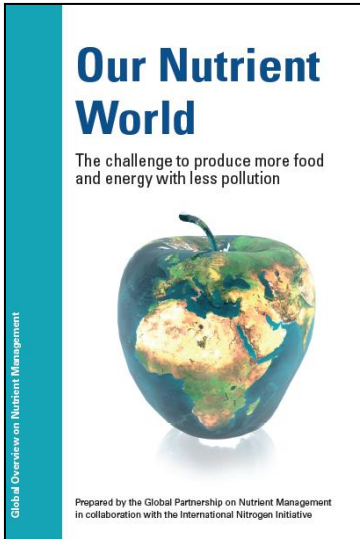
UNECE Gothenburg Protocol Five Priorities for Ammonia

1. Low emission techniques for land spreading of cattle/pig/ poultry manures and mineral fertilizers
2. Animal feeding strategies, inc phase feeding
3. Covers on new slurry stores
4. Farm N balance on demonstration farms
5. Low emission new pig & poultry housing



Global nitrogen flows around year 2000 *(million tonnes N / year)*





Report launched at European Parliament (January 2016)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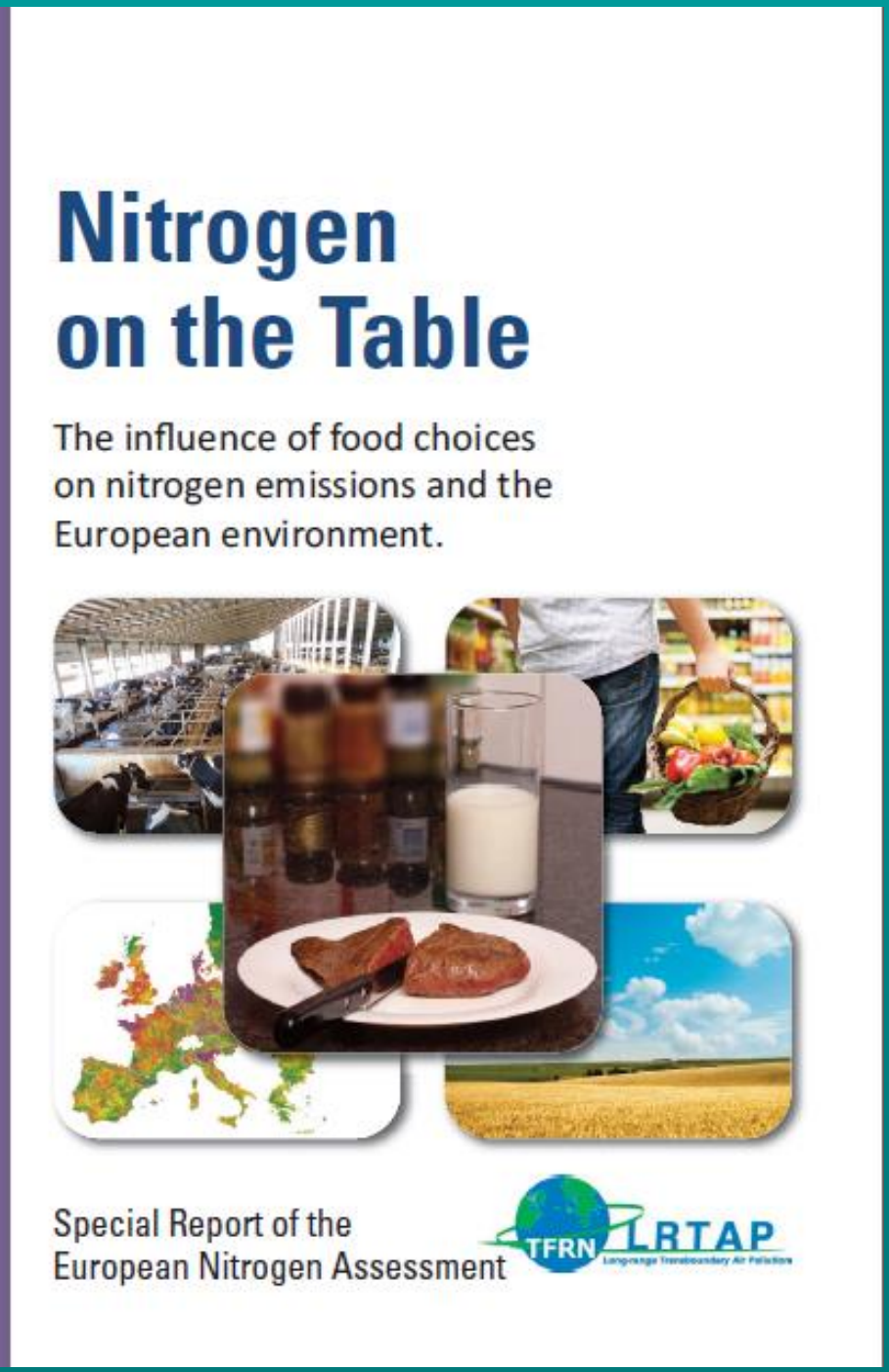


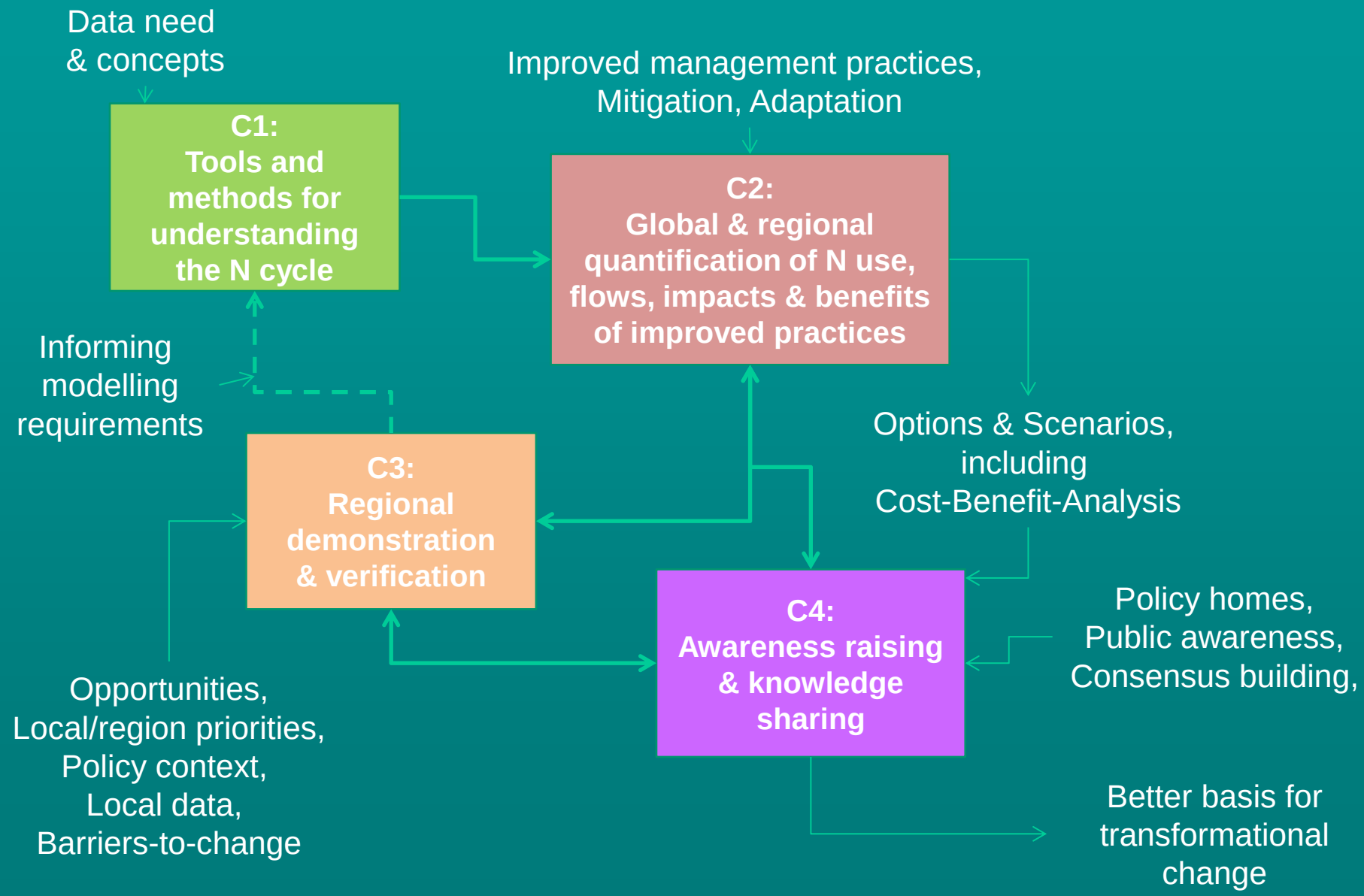
Towards INMS

INMS in brief

- Bringing **scientific evidence** together to inform policies and the public on the multiple benefits and threats of reactive nitrogen
- Being developed as an international process with funding from the Global Environment Facility (GEF)
- Builds on and links together existing nitrogen networking activities

gef UNEP

Towards the International Nitrogen Management System (INMS)



Towards INMS

First Element of INMS

C1:
Tools and methods for understanding the N cycle

- Development of N system indicators
- Threat assessment methodology
- **Methodology for N fluxes and distribution**
- Approaches for N threat-benefit valuation
- **Flux-impact path models for assessment, scenarios & strategy evaluation**
- Barriers to achieving better N management

- National N budgets
- Farm N budgets
- NUE approaches
- Relating different N indicators

Towards INMS

Second Element of INMS

Quantifying N flows, threats and benefits at global and regional scales

Preparation of **Global Nitrogen Assessment** flows, impacts, opportunities

Integrating methods, measures & good practices to address N_r issues

Future N storylines & scenarios with management / mitigation options & CBA

Collation & synthesis of experience & measures adopted by GEF and others

C2: Global & regional quantification of N use, flows, impacts & benefits of improved practices

Towards INMS

Third Element of INMS

Case 1: Developing areas with excess N_r.
Case 2: Developing areas with insufficient N_r.
Case 3: Regions with transition economies.
Case 4: Developed areas with excess N_r.

C3: Regional demonstration & verification

Design methodology & conduct demos on **regional N_r assessments**

Workshop to synthesize outcomes from demonstration activities

Build regional **consensus on benchmarking** N indicators

Demonstrating the benefits of joined up regional N management

INMS Regions & Partners

- Country clusters: Major N sources, N flows, opportunities, NUE, barriers, sharing successes in country clusters

South Asia: India, Sri Lanka, Bangladesh, Nepal, Maldives

- *N. Raghuram, Tapan Adhya & INI South Asia*

East Asia: China, Japan (South Korea, Phillipines)

- *Xiaoyuang Yan & Kentaro Hyashi & INI East Asia*

Lake Victoria Basin: Kenya, Uganda, Tanzania, Rwanda, Burundi

- *Cargele Masso & INI Africa*

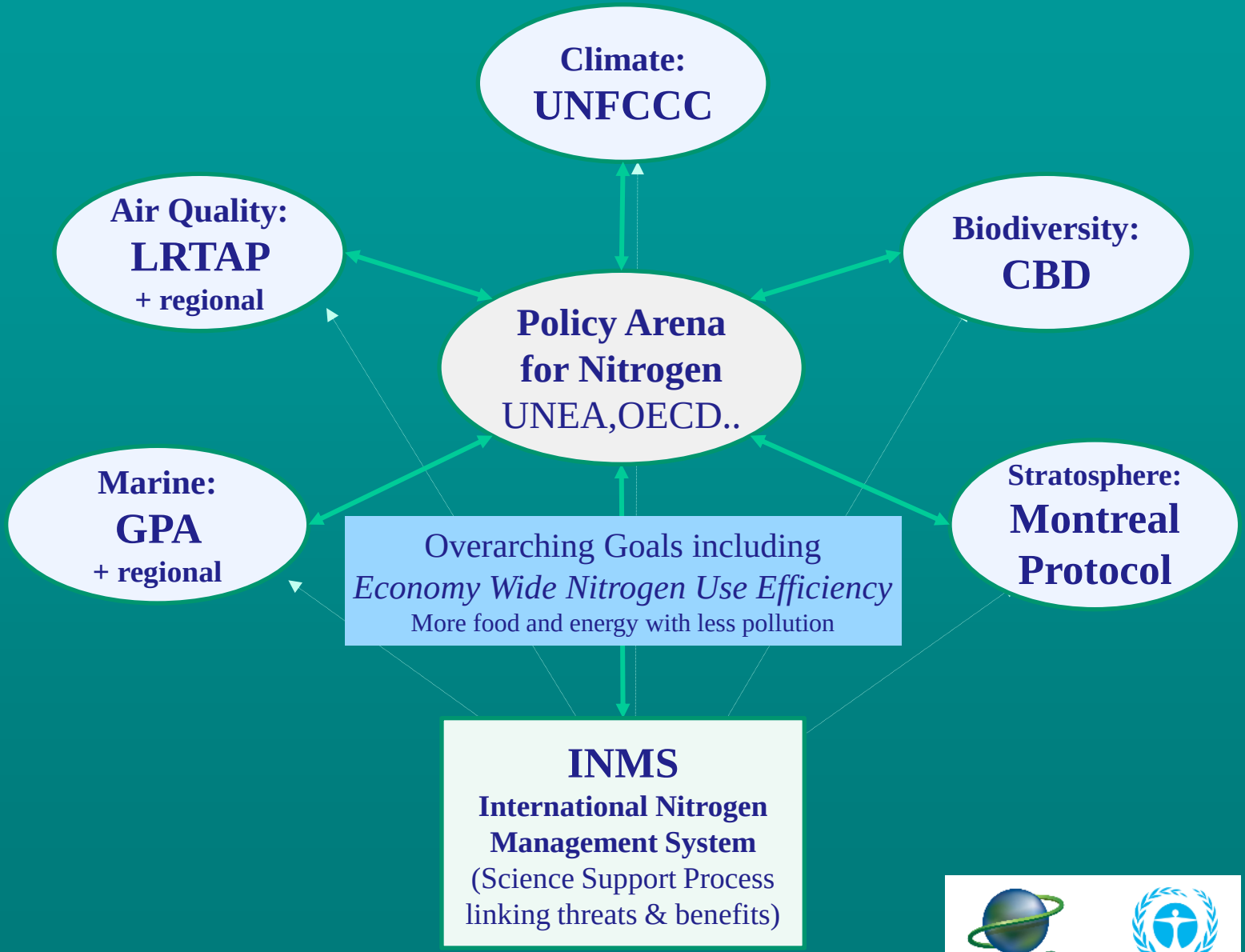
Latin America (La Plata): Brazil, Paraguay, Uruguay, Argentina, Bolivia

- *Jean Ometto & INI Latin America*

Black Sea: Diester, Prut & Lower Danube

- *Lidiya Molychuk & Serge Medinets, EPN-EECCA & INI Europe*

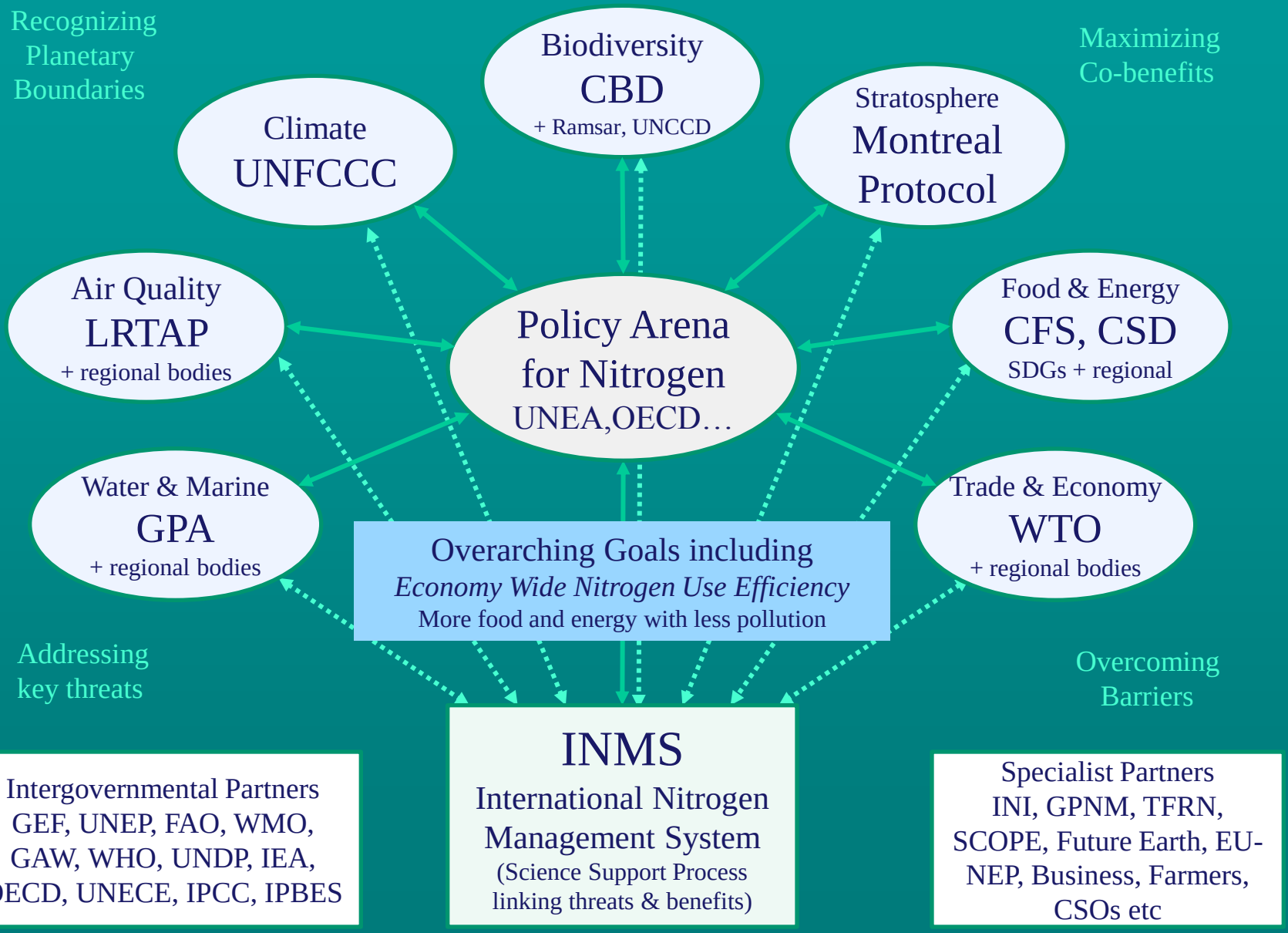
Linking International Nitrogen Policy Frameworks



gef UNEP

Towards INMS

Linking International Nitrogen Policy Frameworks



Documents and Next Steps

- **Completion of Documents.**
  - Annexes available for comment (inms@ceh.ac.uk)
  - **Welcome suggestions, reflections** (expertise, resource balance etc)

- **Letters of Support and Budgeting**
  - GEF grant: US$ 6M; Partner co-finance US$ 60M
  - Letters of Support (completed)
  - Encourage INMS further related proposals…
- **Next steps**
  - More review through Spring/Summer
  - Hopeful kick-off Autumn 2016.
  - 3 years to deliver: plus 1 year to publish