

EPNF2 - 3rd meeting - Minutes¹

Wageningen University - June 21-22, 2017

[Atlas Building 104](#) Droevendaalsesteeg 4, 6708 PB Wageningen

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¹ This document is also available as google document [here](#)

Background

The Expert Panel on Nitrogen and Food (<http://www.clrtap-tfrn.org/content/epnf>) aims “to create a better understanding of the relationship between human diets and the impact of the N-cycle on the environment” (WGSR 47th, September 2010). The objective is to produce a report to

Parties of the Convention on the key questions formulated in the Proposed aims, structure and scope for the second phase of the Expert Panel on Nitrogen and Food (EPNF) (WGSR 53rd, December 2015).

During the 1st meeting (Paris, May 2016²) the general outline chapters of the EPNF-2 report was identified. At the 2nd meeting (Milan, November 2016³), the development of common scenarios was discussed and preliminary outlines of the chapters were presented and discussed. An ‘action plan’ for the next phase was developed. This consisted mainly of review-work done on three topics:

- Nutrition and diets
- Farm level and food chain measures
- Health effects of nitrogen pollution in atmosphere and water

The link to policies and possible societal development should be considered as far as possible.

At the meeting in 11/2016, it was discussed if for each chapter planned in the outline (see below) a peer-reviewed paper could be written, to be published in a special issue tbd. There was agreement however, that in many cases this decision cannot yet be taken, as literature needs first to be reviewed to identify original contribution to the literature. Activities were thus started, mainly with the scope to write review documents the format of which to be decided at a later stage. During this phase, the focus of some of these ‘chapters’ shifted a bit in order to provide added value. This is very welcome, as the Expert Panel strives to provide a comprehensive assessment, adding value to existing evidence with original reviews and partly also with original scientific work (such as data assessment and model simulations). Support to the EPNF report will therefore be given by:

- Peer reviewed review papers providing new perspectives and/or being more comprehensive than existing review papers
- Peer reviewed papers with new data assessments and model simulations
- Background documents summarizing relevant existing evidence under new perspective and/or more comprehensive than existing review papers, however which are considered not sufficiently ‘original’ to be published in the peer reviewed literature and/or where their impact is considered to be too low to invest into a full manuscript
- The report will be complemented by ‘review blocks’ on topics which have already a good coverage in the literature but are considered important to be summarized in order to provide a comprehensive assessment.

The different contributions are schematically illustrated [here](#).

² http://www.clrtap-tfrn.org/sites/clrtap-tfrn.org/files/documents/EPNF2/EPNF2-1_minutes.pdf

³ http://www.clrtap-tfrn.org/sites/clrtap-tfrn.org/files/documents/EPNF2/EPNF2-2_minutes.v2.pdf

Objectives of 3rd meeting:

- Discussion results so far and identification of additional need for information
- Discussion of new analyses to be done for EPNF
- Discussion of model set-up/designs of scenarios

The idea is that the meeting paves the way for the next period (about second half of 2017) which should concentrate on:

- Progressing/finalizing with review papers supporting EPNF
- Starting with model simulations (MagPIE and CAPRI)

Goal is to decide on the following topics:

- Which/how many scenarios will be run?
- Which technical options (farm level and food chain) will be linked to which scenario, with which effectiveness?
- What diets will be used for the different scenarios?
- Which policies will be linked to the different scenarios?
- How are the health effects evaluated (both nutrition and pollution)?
- Are there any review papers or missing background documents 'missing' for the final report?

Minutes

Introduction

AL gave an introduction to the EPNF. See presentation session1.introduction_leip.pptx

Progress presentations

Presentations were given on the progress so far and next steps on the topics farm-level NUE, food chain (two presentations), case studies, diets, alternative proteins, health effect of air pollution, health effect of water pollution, initiatives for diet changes. See presentations session2* [here](#).

Background presentations

SR, BB, SK, FB introduced into the topics of scenarios (link to INMS project), diet-scenarios, and policy framework as background for the following discussions. See presentations session3* [here](#).

Break-out groups on scenarios and policies

Discussions in three break-out groups:

- Scenarios.
- Quantification of possible effect of supply chain policies
- Quantification of possible effect of consumer choice (diet) policies

Main discussion topics were:

- Scenarios: scenario design; harmonization between INMS, Diet-SSPs and other projects (AgMIP, SUSTAg, MACSUR,...); diet storylines elements; paper?

- Policy-groups: which type of policies are possible? How do they map to SSPs? Which parameters do they change? How to structure policies? How to estimate quantitative effects? How large are they? What do they cost? additional paper? Focus should be put on the question if and how the impact of the policies can be quantified.

Minutes/conclusions were provided by each break-out group and are found in the annex.:

- [conclusion of scenario group](#),
- [conclusion of food chain policy group](#), and
- [conclusion of diet policy group](#)

Decisions

Farm-level NUE

- Focus will be changed to ‘innovations’ and evaluate possible farm-level NUE if existing technologies were applied in “ideal” combinations for a number of representative farm systems. In addition, the possible ‘stretching’ of farm-level NUE or rather food-production NUE) will be assessed if technologies not yet available (at large scale) would become available
- Possibly a second paper will focus on the concept that energy need in food production is a separate environmental dimension.
- Suggestion: lead for paper #1: Nick Hutchings; lead for paper #2: Adrian Leip

Food chain NUE

- Focus will be on the quantification of food loss/waste improving on available data sets; illustrative scenarios e.g. SDG of halving food waste and reducing food losses by 2030
- No separate paper/document on circularity aspects (food waste collection, waste management systems, human waste, ...)

Case studies full chain NUE

- No success to obtain detailed data from food chain companies even though contact and cooperation was already available via the Irish Food Board
- This chapter/paper has to be dropped.

Food system policies

- New paper focusing on food system policies; complementary to chapter on ‘policies and societal changes’ (which focuses on consumer behaviour and governmental initiatives).
- Discussion of non-policy mechanisms; understand motivation of private sector towards more sustainability and social responsibility
- Include aspects of circular economy and circularity-focused initiatives
- Identify pattern of changes and causal mechanisms

Diets and food consumption

- This paper should provide information for the development of the diet scenarios. Suggestion to look into historic anomalies (also of subpopulations), their qualitative

reasons, and the magnitude of extreme changes as a basis for possible disruptive changes in the storylines

Alternative protein sources

- Inclusion of nuts as additional vegetal protein?
- Paper very advanced, focus so far on GHG, land and energy footprints; missing aspect of bio-availability and N-footprints.
- Submission already to journal, follow-up paper on N-footprints to be included in EPNF special issue.

Policies and societal changes

- Conceptual framework of policies that can be implemented from a governmental perspective; categorisation of policy-types; highlight health and sustainability challenges.

Diet changes initiatives/policies

- Separate paper from conceptual framework, mapping existing policies into the framework
- Assess “effective” policies to address the challenges identified (strengths and weaknesses)
- Attempt to quantify impact on consumer choices

Health effects of air pollution

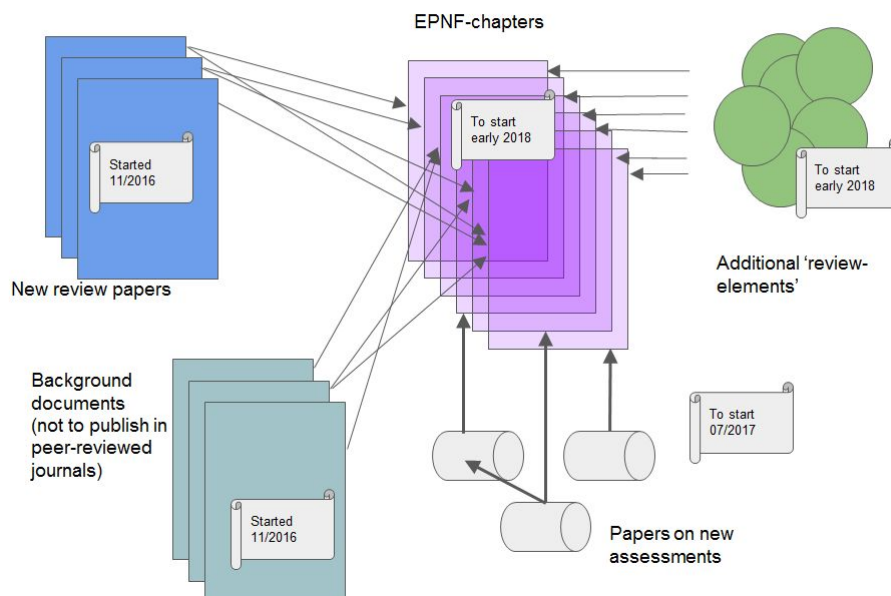
- No fundamental new knowledge therefore background document
- Linkage between FASST model and CAPRI foreseen
- Analysis of new emission scenarios (Diet pathways, Agricultural practices) for air quality and ecosystem impacts

Health effects of water pollution

- No fundamental new knowledge therefore background document
- Analysis of new emission scenarios (Diet pathways, Agricultural practices) for potential risks for drinking water and impacts related to eutrophication will be done with the GREEN/LISFLOOD models based on outputs from the CAPRI (and MaGPIE) model

EPNF report and different ‘types’ of contributions

- The outline of the EPNF report as such was not discussed.
- Background documents and papers however must not necessarily ‘map’ one-to-one to the chapters of the report. Instead, papers/documents can contribute to more than one chapter.
- The EPNF report will contain some sections which will not be covered by the papers/documents. This is because they are available in existing literature. They will be identified once all papers/documents are available.



Outline of papers - status 20170621

PART 1: Food Chain Nitrogen Use Efficiency

- The limits of Farm-scale NUE
- Food losses and circular nitrogen flows in the post farm gate food chain
- Sustainable value chain policies

PART 2: The relevance of Nitrogen for a healthy society

- Current food consumption in Europe
- Policies and societal changes framework
- Mapping Policies for sustainable diets
- Nitrogen-smart diet choices: Alternative protein sources (GHG + Nr)
- Health effect of Nr losses in the food chain

PART 3: Making the case: nitrogen and food

- Representative diet-pathways: the cost of unhealthy diets
- Healthy and nitrogen-smart: trade-off or win-win?
- Reduction of N pollution: improved supply versus changed demand
- Assessment of health effect of air pollution
- Assessment of health effect of water pollution

Timeline

- Most chapters/documents agreed to have a draft version ready late in 2017
- Model scenario calculations will thus start late 2017/early 2018
- First results/draft versions of new assessment papers available spring 2018
- Final papers ready and submitted summer 2018. Start compilation of EPNF report and identification of missing elements
- Spring 2019 - publication of EPNF report and special issue

The timeline considers the fact that IPCC (special) reports are upcoming (Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [see decision here](#), and IPCC AR6-WG3 report, outline to be decided at the [IPCC-46 meeting, September 2017](#)) which might include chapters on food system analysis. To be relevant for those reports Acceptance

Next meetings

- 2017-11/12. Web-meeting on progress-update
- 2018-spring. Face-to-face meeting on first scenario calculation results;
- 2018-summer. Discussion of results and final papers. Fine-tuning of papers. Start working on EPNF report.

Possible venue for the meeting in Spring 2018 will be an [organic goat farm close to Madrid](#). (Proposal Alberto Sanz Cobeña at the TFRN-meeting, Aarhus, 29-30/06/2017).

Journal for special issue

The following journals were proposed:

- [Philosophical Transactions of the Royal Society](#)
- [Global Food Security](#)
- [Food Policy](#)

Due to its highest impact factor we decided to make a first attempt with Philosophical Transaction of the Royal Society.

Marco Springmann has already contacts and will address them early 2018.

Nitrogen neutrality

- It was not possible to quantify the footprint of the meeting. However, lunches (sandwiches) and meeting dinner (insect meal) were designed with low footprints. This includes also the INMS meeting that some participants attended as well with sandwiches as lunch and a vegan meeting dinner.
- From 17 participants
 - 5 were 'local'
 - 1 was traveling by train
 - 11 were traveling by airplane
- One-way distanced varied between 400 km and 1050 km (one way) corresponding to GHG emissions between 0.25 and 0.55 t CO₂eq (two ways). Total GHG emissions for the flight travels were 4.1 t CO₂eq (all calculations done with the online calculator of myclimate https://co2.myclimate.org/en/flight_calculators/new).
- Travel by train (Schiphol-Wageningen), other travels contributed only minimally with around 0.1 t CO₂eq
- With a price of 24 EUR/t CO₂eq (see myclimate) compensation can be achieve with a total of about 100 Euro or about 6 Euro/participant. According to the concept developed for EPNF2-2 (see [Implementation of N-neutrality at the La Forestina meeting](#)) this covers also compensation of the N-footprint.

Annexes

Agenda

Wednesday 2017-06-21 - Room Atlas 1

12:30	13:30	Arrival - Lunch
13:00	14:00	Session 1: Introduction, recap
14:00	15:30	<p>Session 2: Status of work so far</p> <ul style="list-style-type: none"> • Series of short presentation on progress of work on review papers, with focus on objective of paper, problems, timeline see template here • About 5 min each + 5 min discussion <p>Presentations:</p> <ul style="list-style-type: none"> • Farm-scale NUE (tbd) • Food-waste (GG) • Food chain (JS/IK) • Full-chain case studies (AU) • Alternative protein sources (AP) • Initiatives to make food choices more sustainable (LT) • Environmental impact of extra-processed food (RA) • Health effects of air pollution (RK) • Health effects of water pollution (AL) <p>Coffee break 15:30-15:45</p>
15:45	16:30	<p>Session 3: Background presentations</p> <ul style="list-style-type: none"> - scenarios - diet model - policies
16:30	18:00	<p>Session 4: Working groups on scenarios and policies</p> <ul style="list-style-type: none"> • Scenarios • Policies for supply chain mitigation • Policies for diets and nutrition

Thursday 2017-06-22 - Room Atlas 2

0845	09:00	Arrival
09:00	10:30	<p>Session 5 - Linkages between models/chapters:</p> <p><i>In this session we will define the linkage and necessary data sharing between chapter in parts 1 and 2 with the assessment chapters in part 3</i></p>
10:30	11:00	Session 6 - Discussion on missing information for the EPNF report

		(reviews that could give a separate paper or background document) Coffee break 11:00-11:15
11:15	12:30	Session 7 <ul style="list-style-type: none"> ● Presentation and discussion of decisions made by the working groups. ● Actions for next period & overall timeline ● Next meeting ● AOB

Outline of EPNF report, version 2016-11

1 PART 1: Food Chain Nitrogen Use Efficiency

- 1.1 The limits of Farm-scale NUE
- 1.2 Food losses and circular nitrogen flows in the post farm gate food chain
- 1.3 Full chain NUE in Europe and case studies

2 PART 2: The relevance of Nitrogen for a healthy society

- 2.1 Dietary recommendations & nutrition scores of diet
- 2.2 Nitrogen-smart diet choices: Alternative protein sources
- 2.3 Health effect of Nr losses in the food chain
- 2.4 Policies and societal changes

3 PART 3: Making the case: nitrogen and food

- 3.1 Representative diet-pathways: the cost of unhealthy diets
- 3.2 Healthy and nitrogen-smart: trade-off or win-win?
- 3.3 Reduction of N pollution: improved supply versus changed demand

Template for chapter presentations

Please give a [brief summary](#) of the work in your 'group', covering the following aspects:

- Slide 1: Objective, novel aspects of work, target (review paper, background document, original research paper, "summary-blocks", see [here for types of EPNF contributions](#)), main conclusions (if already available)
- Slide 2: Status, current outline, contributors, problems (if any)
- Slide 3: Timeline and coordination (needs) with other 'chapters'
- Slide 4: What is covered and what is *not* covered that would be required/good for the EPNF report (acc. to discussions in November and/or new ideas)
- Slide 5: General comments, missing elements in the EPNF outline/plan

Scenarios - conclusions

[\(back to minutes text\)](#)

Scenario group

Storylines (qualitative)

Stick to 5 SSPs

Being consistent with SSPs, INMS, SUSTAg, MACSUR, AgMIP

Start with storylines: trends based on literature

distinguish into “drivers of consumption”, “consumption”, and “consequences of consumption”

→ create storyline table as living document

Scenarios (quantitative)

focus on quantitative trends for ingredients

start with statistical regressions

diverge from statistical regressions based on storylines and historical anomalies

→R will look into historical anomalies (also of subpopulations), their qualitative reasons, and the magnitude of extreme changes

apply some convergence method (S will provide input)

rejustify the new diets with policy instruments

Final aim: provide diets for impact papers (environment+health)

Time plan:

September: Paper draft for qualitative storylines

November: Paper draft for quantitative scenarios

Quantification of possible effect of supply chain policies - conclusions

[\(back to minutes text\)](#)

Working stream: Potential policies for Supply chain

28 June 2017

Starting from definition of supply chain (or value chain) presented in figure 1, we discussed existing and possible policies to mitigate nitrogen losses and achieve sustainable food production.

It is a regulated sector in Europe mainly by the Common Agricultural Policy (CAP). Cross-compliance, Greening and agri-environmental schemes are examples of environmental regulation within the CAP.

Other existing measures enabling to promote sustainable production are: co-fund investment cost for adoption of new technologies (i.e. adoption of precision agriculture, no-tillage or minimum tillage technologies); supporting creation of network to reduce transaction cost to acquire information on available innovation; cooperation among farmers. Integrated chain program to promote coordination along the supply chains

Possible new to be applied on production sector are

- Policies for alternative incomes, to compensate income reduction due to reduction of environmental pressure
- Policies to reduce the synthetic fertilizer and to promote agro-ecology farming systems
- Incentives to pay farmers if they produce more leguminous (option to increase greening prescription)
- Labelling / certification for sustainability production along food supply chain

The design of new policy should pay attention at the following factors:

- Fair prices for farmers, avoid to charge farmers of further costs (i.e. avoid to apply further measure based on Polluter Pay Principle)
- Incentives for best practices (based on Provider Gets Principle)
- Eat local food (barriers)
- Easy access to technology and reduce transaction costs

This stage of food supply chain is less regulated as compared to production stage. The transition toward sustainability in private sector is supported by private initiative motivated to increase brand image visibility and social responsibility (i.e. Barilla or Entire food chain with sustainability label certified by WWF i.e. Tomato food chain in Italy). However, no

policy oversees these initiatives and the process of auditing and certification is not fully transparent.

Possible policy are:

- Environmental taxes at food processing and retailers level. Introduction of Pigovian Tax. We identify possible rebound effect on increase food prices or a potential burden to the economic growth (i.e reduction of the employment)

These policies may be analysed in scenarios of :

- SSP4 - Inequality (reduction of access to food for poor)
- SSP5 - Materialist Growth

Circular economy have a prominent role in reducing food waste:

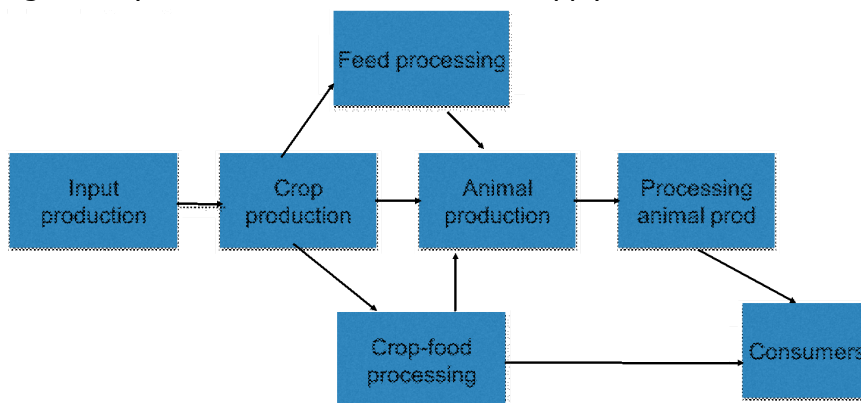
- Use of food wastes/losses as feed
- Use of food losses/wastes for energy production and compost

There is a need to design better policy to categorise of food wastes

- Wastes management, sewage recycling, wastewater management (waste to resource)
- Food waste in restaurant - > reduce hygienic regulation
- Different amount of food waste can be observed in
 - SSP1 (Sustainability), SSP3 (fragmented world), SSP4 (inequality)

Several papers study the impact of these measures. There is a large literature on the impact of CAP and quite extensive analysis of impact of introduction of environmental taxes. A review of existing policies and proposal would provide insights into their potential effect on nitrogen pollution and nitrogen use efficiency.

Figure 1 System boundaries of the food supply chains



Quantification of possible effect of consumer choice (diet) policies - conclusions
[\(back to minutes text\)](#)

Diet policies

Qualification/quantification of (potential) effects of policies for a more sustainable (incl health) food choice

28 June 2017

1. Which type of policies are possible?

Starting from the policy framework (see Table 1 below, including education, (semi)regulatory, subsidies and taxing, organizational/capacity building policies, with a focus on governmental policies and EU countries.

Targeting healthy and environmentally friendly diets.

The overall challenge is (for a more sustainable (incl health) food choice):

- to reduce the prevalence of non-communicable diseases (NCDs) via obesity and thus avoid overconsumption
- to consume less animal and more plant based diets

2. Which parameters do they change?

- % of obese, % of overweight individuals in a certain population, Ratio energy intake/energy expenditure
- Ratio of animal and more plant based diets (in gram, in protein)

3. How to structure policies?

Available policies are structured according to the scheme as in Table 1., we start from implemented policies and discuss the types of effects, e.g. on awareness, purchases, exposure, health and/or consumption.

4. How to estimate qualitative/(potential) quantitative effects? How large are they? What do they cost (in terms of consumer benefits)?

We will define a search strategy.

We map according to type of policy, see above.

Depending on available open access (scientific) literature starting (from reviews) we try to map effectiveness either in a qualitative (weak to strong or quantitative way (see parameters above)).

Start with implemented policies. If needed take into account policy scenario analyses.

Focus is first EU, maybe some nice (=effective) examples come up such as Sugar sweetened beverage tax in Mexico, look in Global monitoring Framework and best buy surveys.

5. Define policy types matching the 5 SSPs.

Later stage-

6. Additional paper?

No this is in the paper as planned. We discussed that when the two chapters on “Policies and societal challenges” and “Mapping policies in the EU...” are finalised we could propose a policy “score” on some countries policy implementation based on our findings of “effective or strong”

policies and could then try to correlate/associate this to some data on consumption and obesity prevalence.

Task?	Who?	When?	Done?
Description of the policy Framework	S,F	August	20 August
Description of the overall challenge	L,M		
Define search strategy description	A,S		
Propose the lay-out of a table for inventory of “effective” policy	A?,S,R	to decide with other co-authors	to decide with other co-authors
Literature review			
Draft 1 of this chapter/paper		15 Oktober 2017	

Chapters with main authors:

2.0 Diet and food consumption trends and drivers in Europe

2.1 Policies and Societal Challenges

2.2 Mapping (effective?) policies in EU

The chapters 2.0, 2.1 and 2.2 have a strong linkage.

Chapter 2.1 will be descriptive and propose a conceptual framework of policies that can be implemented and how to categorise between types of policies (see last table) and highlight the common health and sustainability challenges related to food consumption.

The objective is to show, from a governmental perspective, what types of policies that are potentially available and discuss the key differences between these policies and how they provide costs and benefits to individuals and business. Susanna will take the lead and Fabio will contribute. Liesbeth and Mirjam will describe the (quantitative) targets/challenges related to obesity and plant based consumption, e.g. key political commitments and societal challenges related to sustainable consumptions.

The chapter 2.2 will build on 2.1, by its objective to map “effective” policies to address the challenges addressed in 2.1.

We will also build on the framework outlined in 2.1 and discuss the strength of evidence of different interventions as categorised by the framework. (see table below).

Table 1: The types of policies that is possible to implement from a governmental (and societal) perspective.

	Policy instruments			
Overall challenge : Sustainable diets	Educational/ Information	Regulatory	Taxing/Subsiding	Organizational/ Capacity-building
1. Reduce meat and increase plant based consumption	Food Based Dietary Guidelines including sustainability	Regulations; nutrition labelling Standards on food served in school Regulations on retail provision in communities Regulations on food content , e.g. maximum content of meat	Taxes to increase consumer prices on meat/animal products	Provision of free school lunches
	<ol style="list-style-type: none"> National dietary guidelines Information on positive effects of increased plant based diets Information on negative health effects of animal products Information on climate and environmental effects of different foodstuffs Information/education on how to cook vegetarian food Education within culinary profession, and as further education of chefs/canteen staff Reduced advertisement for animal products 	Co-regulations , e.g. Marketing restrictions for children	Reduced price on fruit and vegetable s/plant-based foods	New food and nutrition and environment centers "environmental nutrition" as a topic of study in university curricula
		Voluntary initiatives; e.g. restaurants associations offering "Meat free Monday" Choice architecture in shops		
Procedural Policies : Polices guiding who should be involved and how they should do! Accountability frameworks Joint-up evaluations between health and environmental agencies Commissions on new studies to gather intelligence Consultations processes Creating of inter-departmental advisory committees Evaluations and reviews of legislative processes Research Monitoring				