EASAC project on climate change and health:
Estonia 13th Sept. 2019

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The imperative of climate action to protect human health in Europe:

Opportunities for adaptation to reduce the impacts, and for mitigation to capitalise on the benefits of decarbonisation

Professor Patrick Goodman TU Dublin and RIA member of EASAC project Working Group

EASAC Project and working Group

- Range-finding discussions with DG Sante and DG Research, March 2017
- Project announced on www.easac.eu May 2018
- Working Group met April and November 2018
- EASAC report does not attempt exhaustive compilation of literature but quotes systematic reviews and representative publications to exemplify specific points for Europe, guided by WG expertise
- Countries represented in Working Group: Cyprus, Czech Republic, Finland, Germany, Greece, Ireland, Netherlands, Poland, Portugal, Sweden, Switzerland, UK (others involved via EASAC Council, Biosciences Steering Panel)
- Peer review early 2019, report published 4th June 2019
- Discussed at special EU meeting 7th June 2019

Talk structure

- outline of the key findings and recommendations of the EASAC report
- mention the other two key publications in the area
- Brussels 7th June 2019 meeting with Chief science advisors to the commission
- Lancet countdown on CC, and COP24 WHO.
- Consider the specific aspects in relation to Ireland/Estonia and what steps we need to consider/take in respect of Climate change and health.

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EASAC concern is motivated by the risks to health in the near future: our **main messages**

- **Climate change is happening and is attributable to human activity**
- **Climate change is adversely affecting human health**
- **Climate change can have effects on health within the boundaries of the EU and also through its effects on the health of populations outside the EU**
- **Rapid and decisive climate action could greatly reduce the risks to health**
- **Solutions are within reach and much can be done by acting on present knowledge, capitalising on the health co –benefits of decarbonisation**
- **The scientific community also has important roles in generating new knowledge and countering misinformation**

Key Recommendations of EASAC report

- **Health** needs to be included in **ALL** policies (at national and EU level).
- Incorporation of Health Impact assessment in all Climate change adaptation and mitigation strategies
- Development of dietary guidelines for sustainable healthy diets.
- At a Global level, building of links between the Climate and Health Policies of the EU, WHO, G7 and G20, with collective action on the SDG.

Context

- Over 157 Million more people exposed to heatwave events in 2017, compared to 2000.
- Small changes in temperature and precipitation can result in large changes in the suitability of transmission of important vector-borne and water borne disease.
- Populations in Europe, at risk from heat due to the rising vulnerability of the aging population.
- Mortality rates from malignant melanoma have risen markedly in Europe
- (Lancet Countdown 2018 Watts et al)

Figure 3

Climate change impacts health both directly and indirectly, but is strongly mediated by environmental, social and public health determinants. From references (14, 28-32).

DIRECT IMPACTS

- Storm
- Drought
- Flood
- Heatwave
- Temperature Change
- Wildfires

INDIRECT IMPACTS

- Water Quality
- Air Quality
- Land Use Change
- Ecological change

MEDIATING FACTORS

ENVIRONMENTAL

- Geography
- Baseline weather
- Soil / dust
- Vegetation
- Baseline air / water quality

SOCIAL

- Loss of habitation
- Poverty
- Displacement
- Conflict
- Age and gender

RESILIENCY

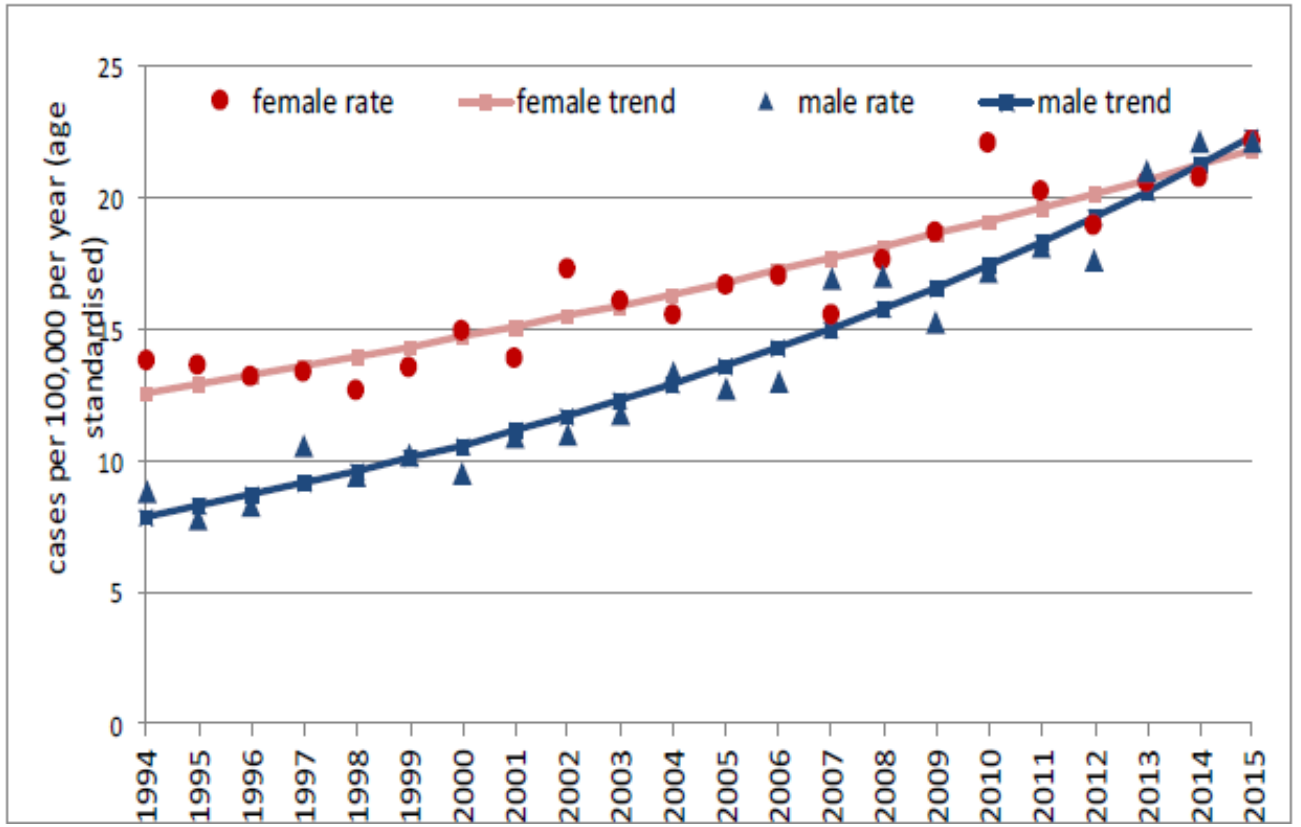
- Early-warning system
- Socioeconomic status
- Health and nutrition
- Primary health care

EASAC report in the Estonia context

- Vulnerable
  - The old, the very young and those with existing chronic conditions
- Extreme Events
  - Mounting evidence of more extreme weather events (summer and winter)
- Migration
  - As climate change affects parts of Africa and Middle east, increased migration into EU
- Mental Health
  - Flooding is linked to increases in Mental Health and stress issues
- Warning systems
  - We need **appropriate warning systems** for climate events

Skin Cancers in Ireland (national Cancer registry)

Figure 3: *Trend in incidence for melanoma 1994-2015*



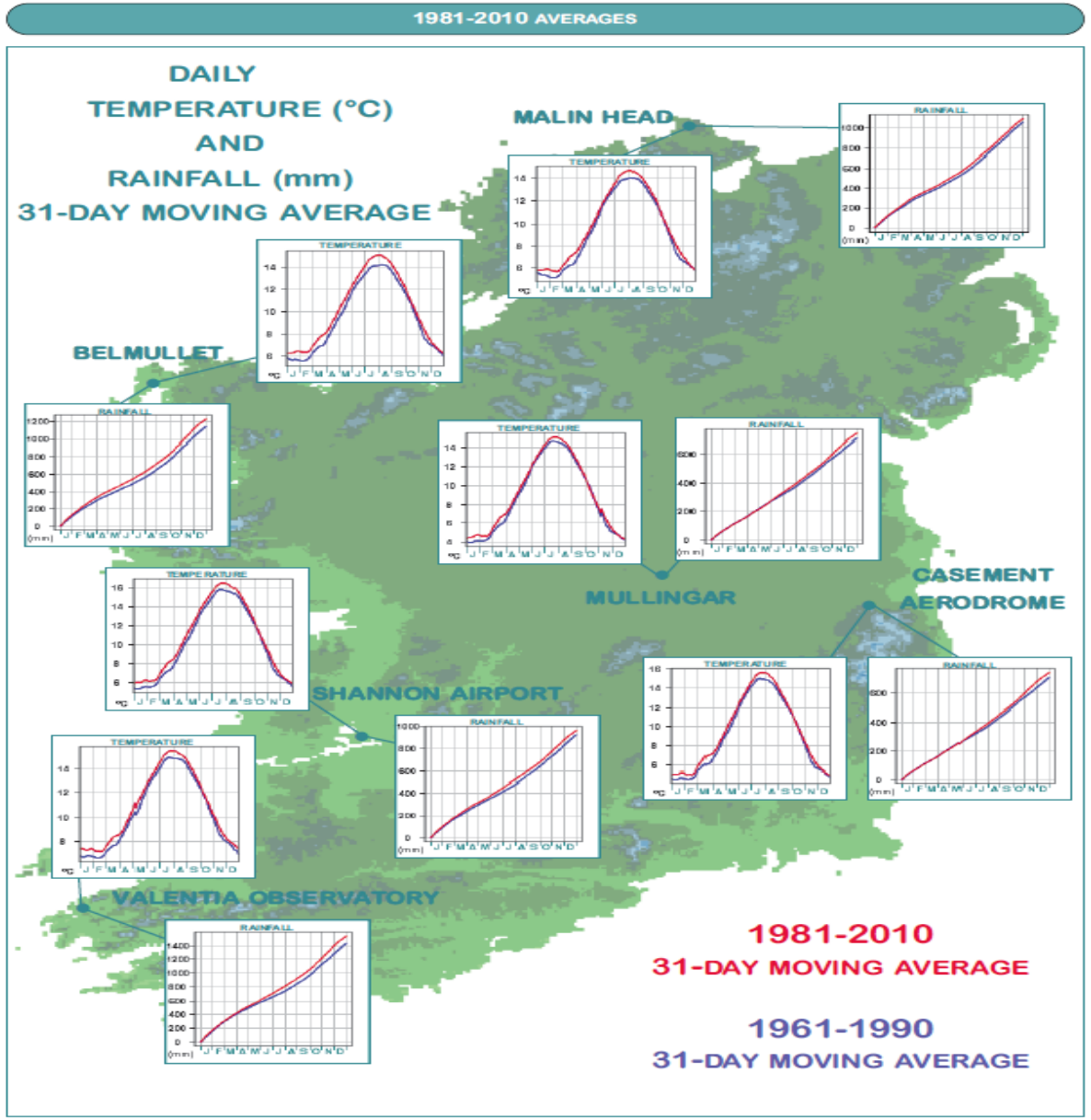
Skin Cancer rates in Women (World Cancer Research Fund)

Rank	Country	Age-standardised rate per 100,000
1	Denmark	33.1
2	New Zealand	31.1
3	Norway	30.7
4	Australia	27.5
5	Sweden	26.2
6	Netherlands	25.4
7	Germany	24.0
8	Belgium	23.9
9	Slovenia	19.7
10	Switzerland	19.5
11	Ireland	19.0
12	Finland	15.9
13	Luxembourg	15.4
14	UK	15.3
15	France (metropolitan)	12.9
16	Austria	12.6
17	Czech Republic	12.4
18=	Canada	11.7
18=	Iceland	11.7
20	Estonia	11.4
21=	Italy	11.0
21=	US	11.0
23	Greece	10.3
24	Hungary	10.1
25	Lithuania	9.0

Skin Cancers in Estonia

- Rising at ~ 4% per year
- (Padrik et al, Acta Oncol. 2017)

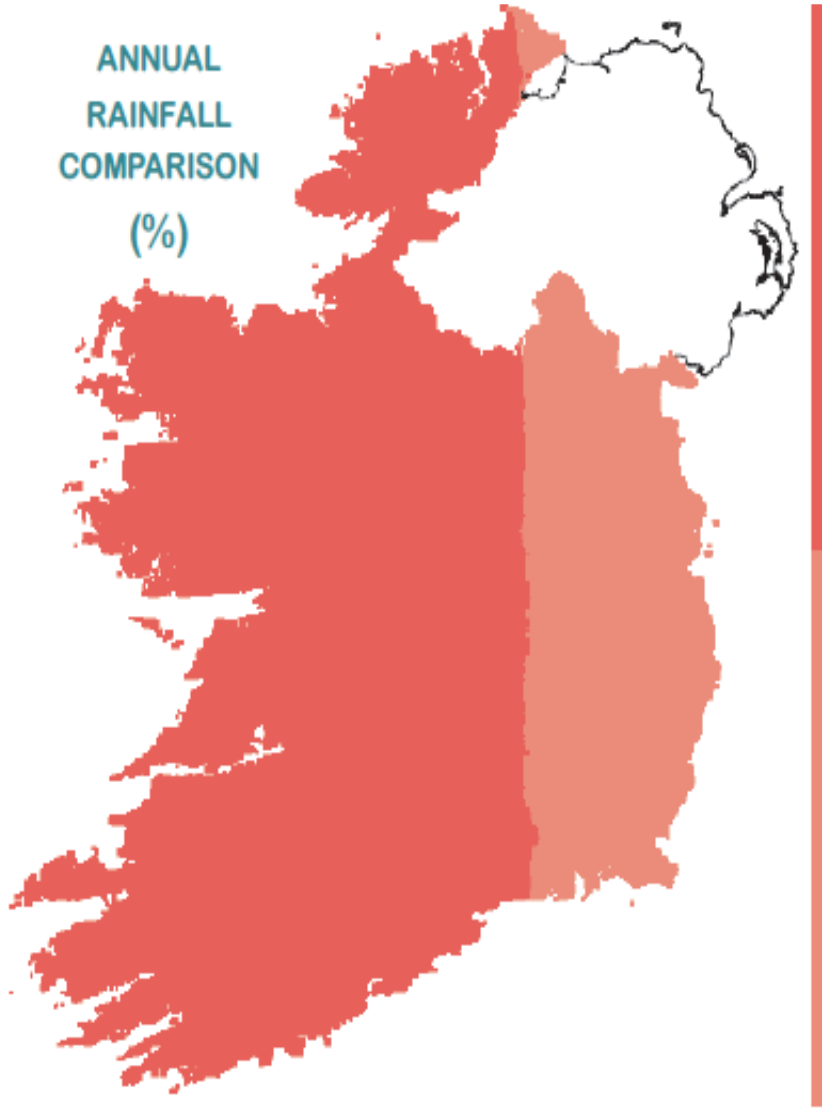
Ireland Climate Data (Met Eireann note no. 14 Ed S Walsh)



Temperature data Ireland

- **ANNUAL MEAN TEMPERATURE**
- **Generally, there has been an increase of approximately +0.5°C in mean temperature between the 1961-1990 and the 1981-2010 periods, with the highest increases in the Southeast. Maximum and minimum temperatures have also increased by approximately +0.5°C.**

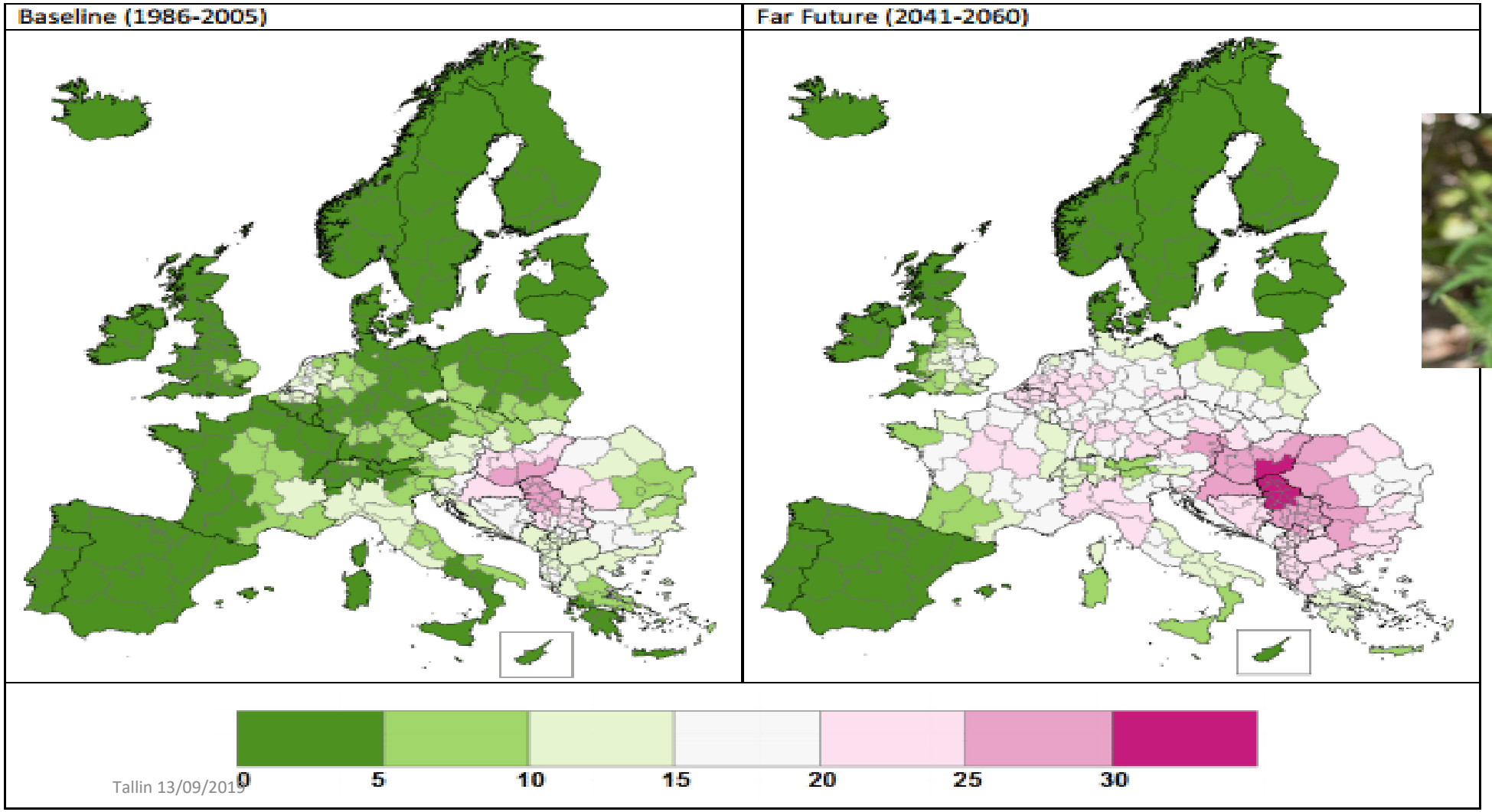
- **SEASONAL MEAN TEMPERATURE**
- **All seasons show a rise in mean temperature with the Spring and Summer seasons displaying the largest differences between the two periods of approximately +0.7°C .**



ANNUAL RAINFALL

On an annual basis, averaged over the country, there has been an increase of approximately 5% in rainfall totals between the two normal periods (1961-1990 and 1981-2010), with the higher increases in the Western half of the country.

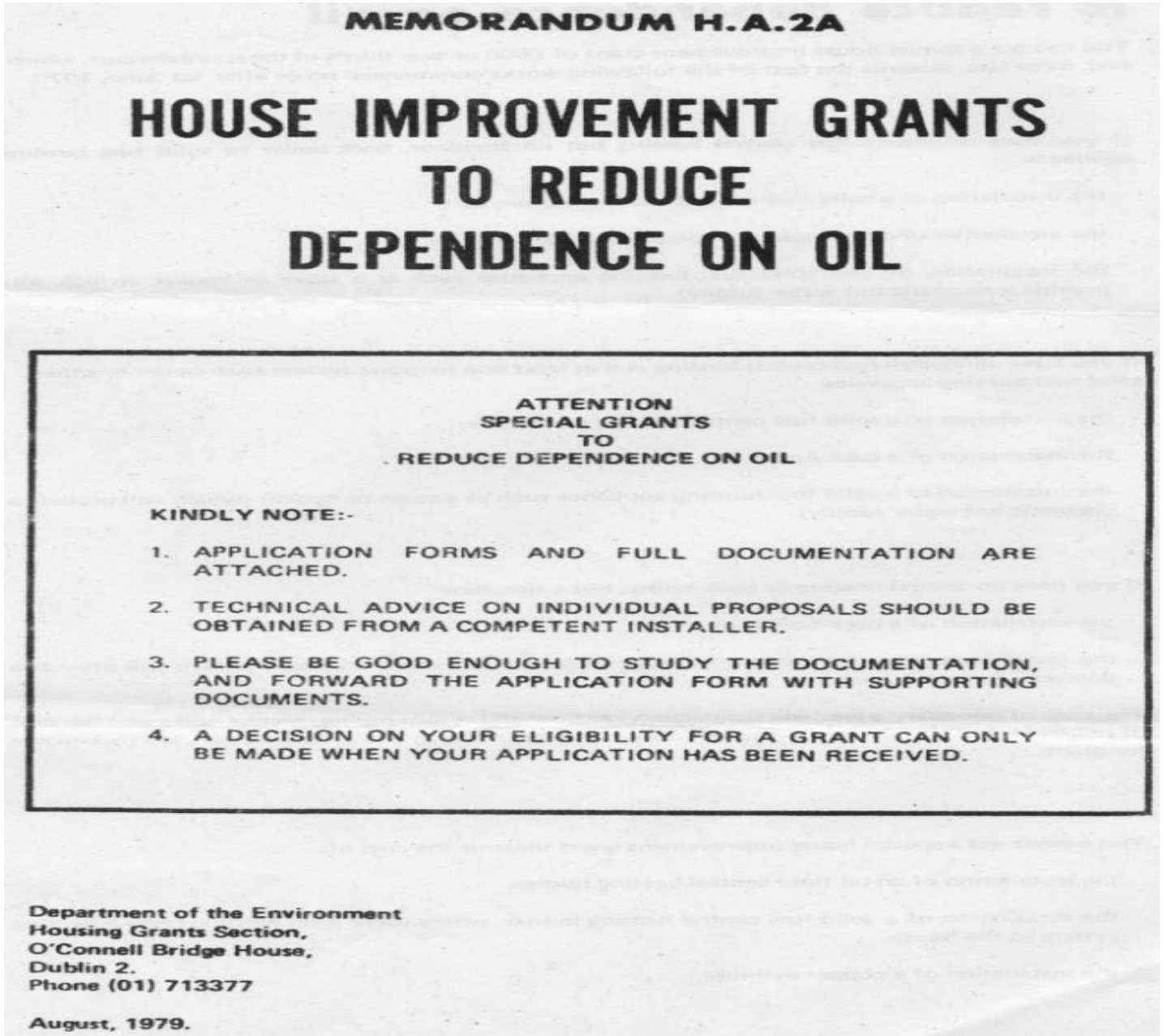
Currently, 33 million people in Europe are affected by ragweed pollen, 77 million projected between 2041 and 2060.(Lake et al 2016)



Unintended consequences

- Use of Coal in Ireland in 1980 as a response to the Oil crisis
- Rise of diesel car usage in Europe, to reduce CO2 emissions
- New sealed buildings to conserve energy
- Huge increase in air pollution
- Increase in particulate and Nitrogen Oxide emissions (especially in cities)
- Get too warm in summer, need air conditioning, thus less energy efficient

Irish Government Response



MEMORANDUM H.A.2A

HOUSE IMPROVEMENT GRANTS TO REDUCE DEPENDENCE ON OIL

ATTENTION
SPECIAL GRANTS
TO
REDUCE DEPENDENCE ON OIL

KINDLY NOTE:-

1. APPLICATION FORMS AND FULL DOCUMENTATION ARE ATTACHED.
2. TECHNICAL ADVICE ON INDIVIDUAL PROPOSALS SHOULD BE OBTAINED FROM A COMPETENT INSTALLER.
3. PLEASE BE GOOD ENOUGH TO STUDY THE DOCUMENTATION, AND FORWARD THE APPLICATION FORM WITH SUPPORTING DOCUMENTS.
4. A DECISION ON YOUR ELIGIBILITY FOR A GRANT CAN ONLY BE MADE WHEN YOUR APPLICATION HAS BEEN RECEIVED.

Department of the Environment
Housing Grants Section,
O'Connell Bridge House,
Dublin 2.
Phone (01) 713377

August, 1979.

Ballyfermot, Thursday 24 November 1988, 4pm

Effect of Air Pollution Control on Mortality in Dublin

Clancy et al, Lancet

- Effect of ban on sale of coal on air pollution in Dublin
  - 36 $\mu g/m^3$ BS (-71%)
  - 11 $\mu g/m^3$ SO_2 (-34%)
- Effect on mortality
  - 7% Total Mortality
  - 13% Cardiovascular
  - 16% Respiratory
  - 3% Other

Some examples from Ireland

- Smoky Coal ban
- Plastic bag levy
- Workplace smoking ban
- Now the challenge is on Climate change

Early Warning systems!
Flooding a particular concern in Estonia

Warning systems

- Need to be tailored to local situations and needs
- Need Health service involvement
- Societal involvement
- Needs to be timely
- Advice needs to be appropriate and relevant
- **Health needs to be integrated into all policies**

Fossil Fuel usage

Fossil Fuels

Heating/Transport/Energy

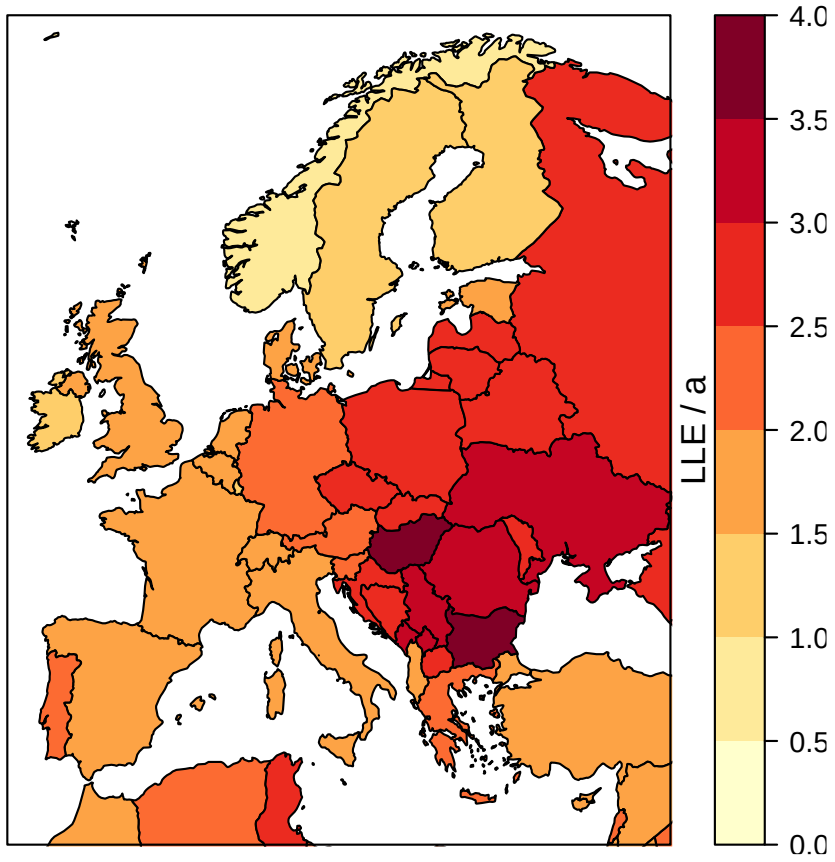
- Emit air pollution and Greenhouse gases
- Not efficient form and not sustainable
- Air pollution associated with over 1000 premature deaths in Ireland per year (Estonia ~200)
- Coal the **MOST** polluting fossil fuel

Potential solutions

- Move to renewables, and get co-benefits of reduced air pollution and GHG
- Retro-fitting and improvement of energy efficiency of housing stock, shown to be cost effective
- Reduced mortality and morbidity and costs to health service, better quality of life

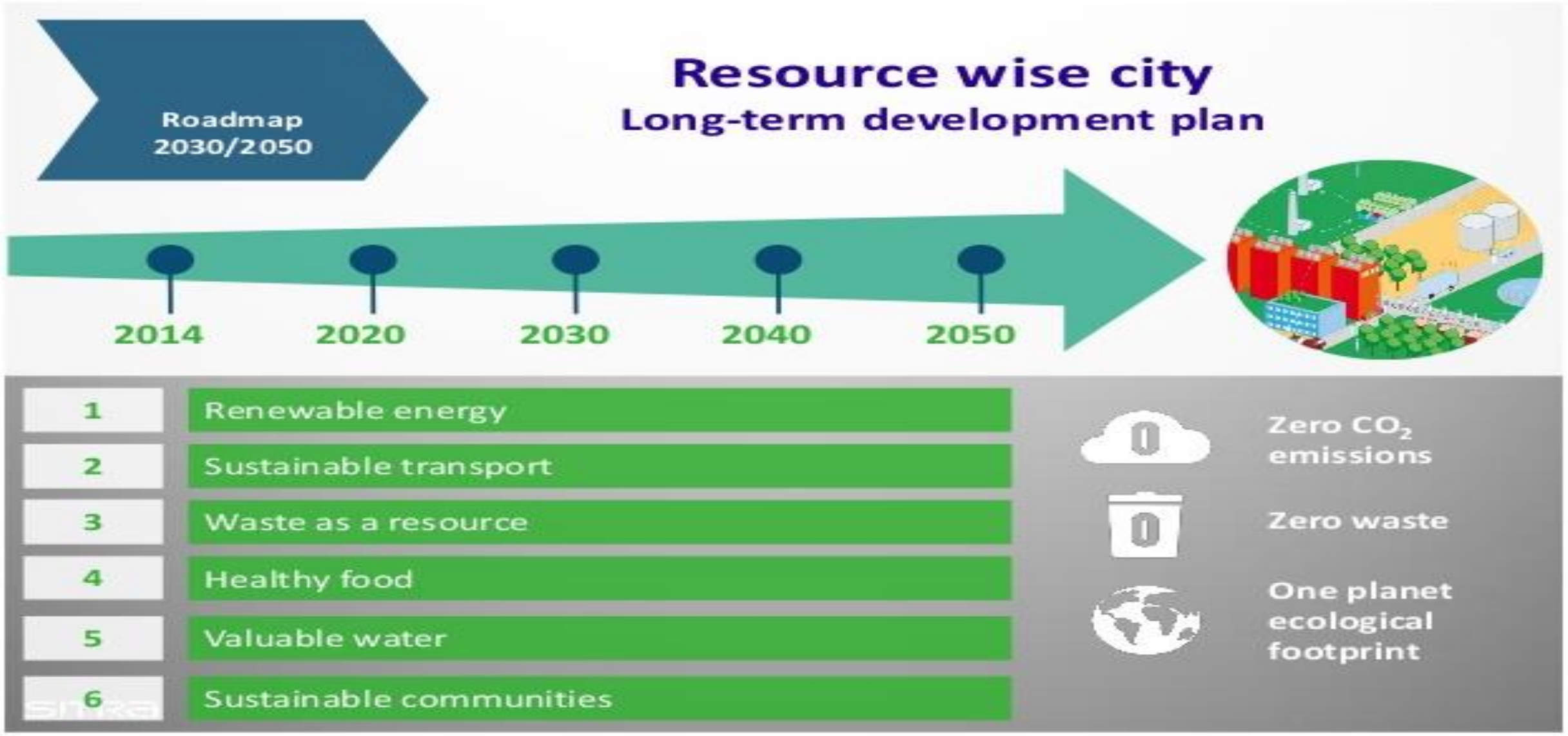
Health co-benefits of decarbonizing the European economy-Phase-out of fossil fuels would avoid excess mortality of ~350,000 persons/year in EU-28 from air pollution

(Lelieveld, Klingmüller Pozzer, Burnett, Haines, Ramanathan PNAS 2019)



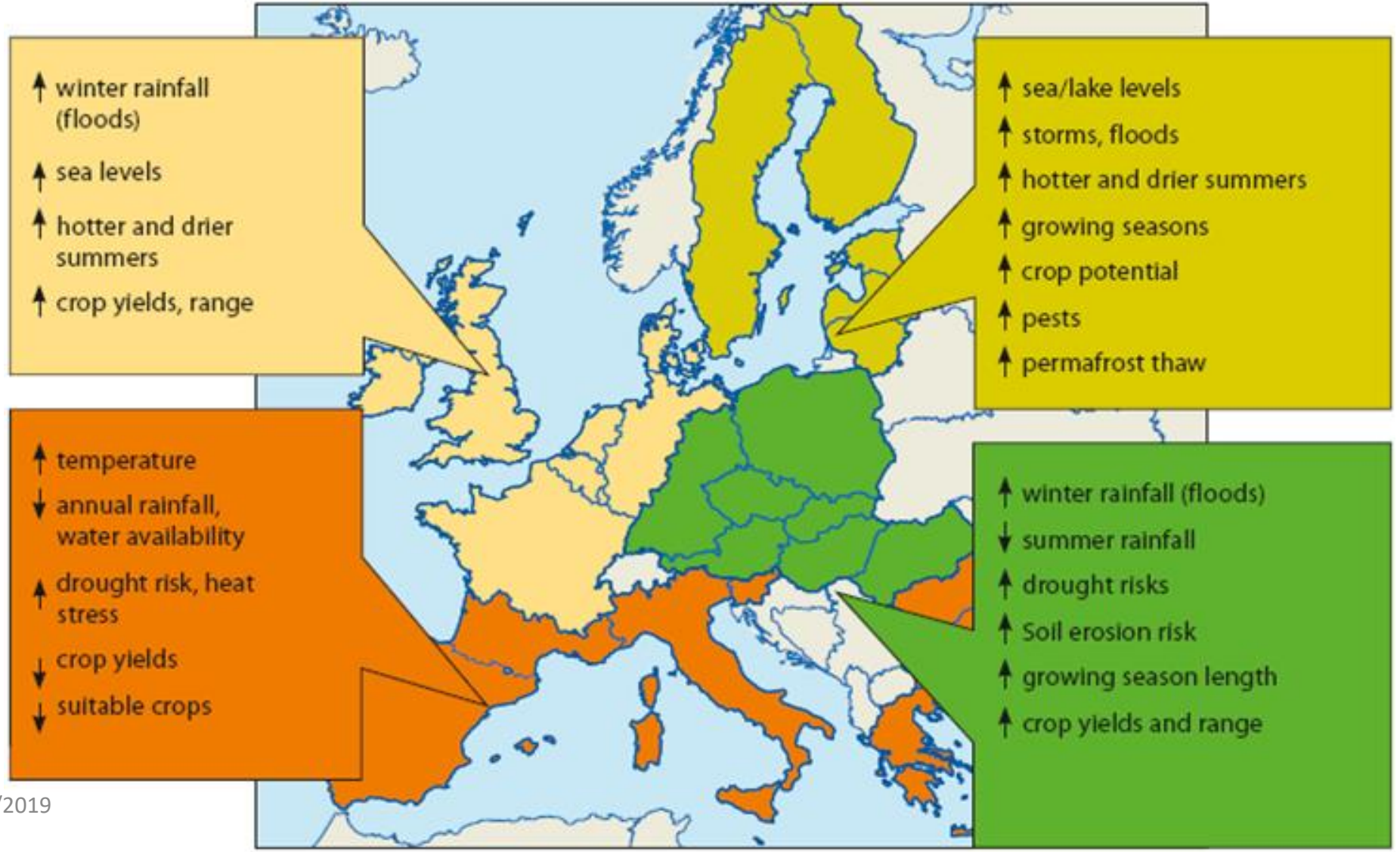
Loss of life expectancy attributable to ambient air pollution (years)

Healthy sustainable cities



Potential effects on agriculture

http://adapt2clima.eu/en/climate-change-agriculture



Estonia	Ireland
Land area 49,340km^2	84,421km^2
Population ~1.4M	~ 5M
Costal area 3794km	3,171km
GHG Emissions 21.1 M Tonnes of CO_2 equivalent	63.8 M Tonnes of CO_2 equivalent

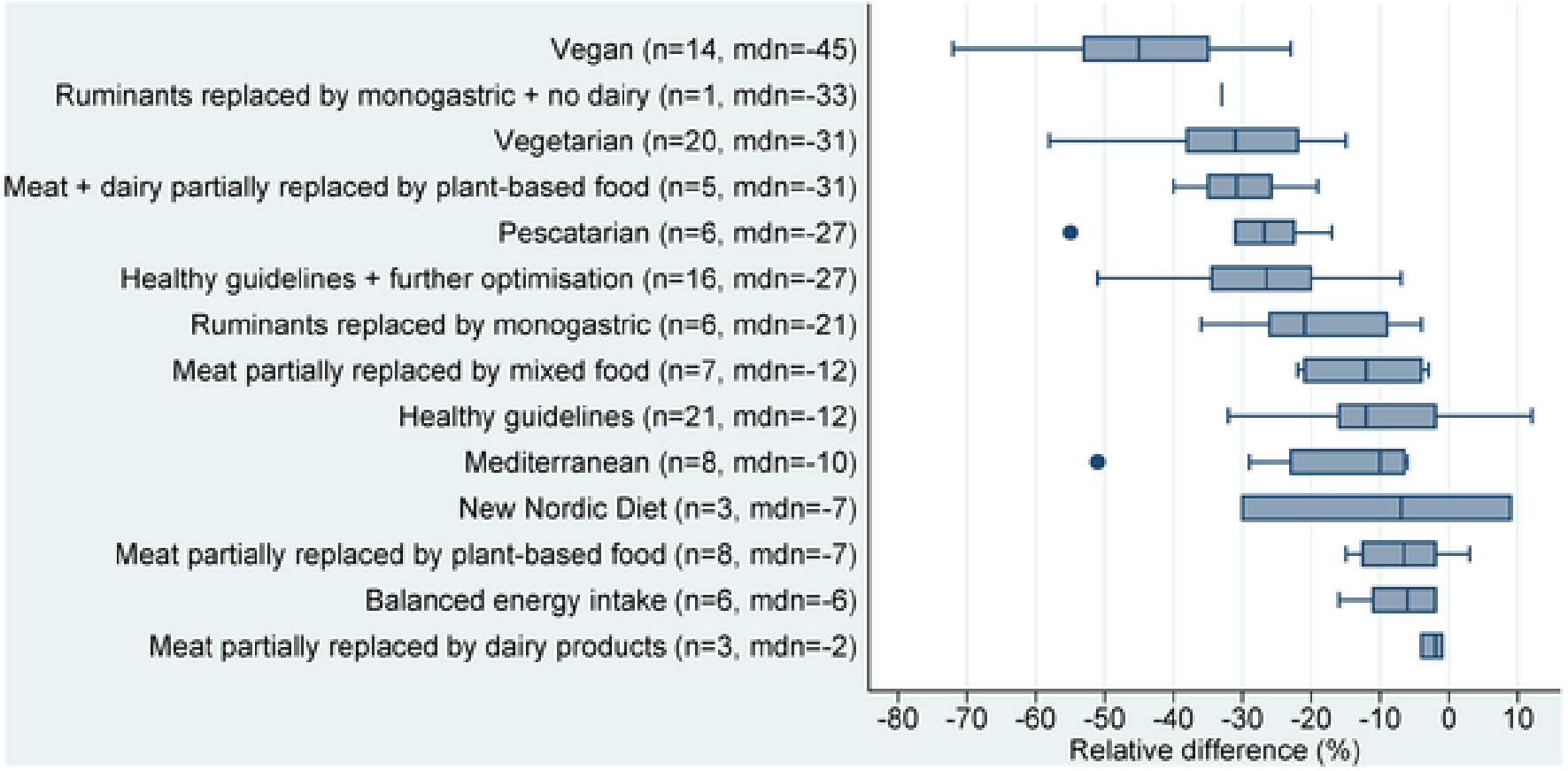
Greenhouse gases by sector

	Estonia	Ireland
• Transport	11%	• 19.8%
• Farming	6.6%	• 33.3%
• Energy	70%	• 19%
	Car Fleet	**Car Fleet**
• Car ownership	534 (per 100,000)	• 443 (per 100,000)
• Diesel Cars	38.6%	• 49%
• Electric cars	~0.5%	• ~1%

Climate change and Ireland

- Declared A Climate emergency in 2019
- Government Action to Oversee Climate action is good
- (Plan itself not so good)
- Divest Sovereign Wealth fund
- Identification of River floor areas and action plan and funding
- Plan to ban diesel and petrol cars from 2030 and also gas boilers
- Investment in CLEAN renewable energy sources
- Good winter emergency response system to Climate events (need a similar summer system)
- New bus fleet (all diesel, not even hybrid!)

Fig 2. Relative differences in GHG emissions (kg CO2eq/capita/year) between current average diets and sustainable dietary patterns.



Aleksandrowicz L, Green R, Joy EJM, Smith P, Haines A (2016) The Impacts of Dietary Change on Greenhouse Gas Emissions, Land Use, Water Use, and Health: A Systematic Review. PLoS ONE 11(11): e0165797. doi:10.1371/journal.pone.0165797
http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0165797

Modelled dietary change and GHG emissions. Based on UK figures (Milner et al 2015 BMJ Open)

- Average dietary CO2e emissions per person in the UK are ~**2050 kg/year** (or 5.6 kg/day)
- Following optimisation to **meet WHO nutritional guidelines**, CO2e emissions per person reduced to ~**1700 kg/year** (4.7 kg/day)
- ~**17%** decrease in dietary GHG emissions
- The dietary changes would save ~**7 million** life years over 30 years, mainly from reduced **coronary heart disease.**
- Projected increase in life expectancy of ~ **8 months**
- **Would expect a similar change in life expectancy for Estonia**

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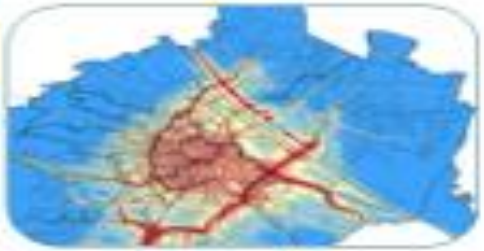
Strengthening adaptation to protect health

The EU Strategy in a Nutshell

Priority 1: Promoting action by Member States	
Action 1.	Encourage MS to adopt Adaptation Strategies and action plans
Action 2.	LIFE funding, including adaptation priority areas
Action 3.	Promoting adaptation action by cities along the Covenant of Mayors initiative
Priority 2: Better informed decision-making	
Action 4. Knowledge-gap strategy	
Action 5. Climate-ADAPT	
Priority 3: Key vulnerable sectors	
Action 6.	Climate proofing the Common Agricultural Policy, Cohesion Policy, and the Common Fisheries Policy
Action 7.	Making infrastructure more resilient
Action 8.	Promote products & services by insurance and finance markets



Engaging the public for action on climate change and health

- Eurobarometer data show 92% EU citizens regard climate change as serious problem
- But other research indicates that climate change beliefs may have only small effect on how people are willing to act
- Public health effects make impacts more personally relevant
- Problem: misinformation has been used to create doubt about global warming and impacts – scientific community must be more pro-active in demonstrating scientific consensus and confronting misinformation

We have many Challenges ahead and much learning to do

- Thank you for providing me with the opportunity present this EASAC project to you
- Thank you to all on the EASAC working group

- Thank you for your attention

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