

The Pathway to the Target

Reducing the Risk for Current & Future Generations

Drew Shindell

*Nicholas School of the Environment, Duke University
&
Scientific Advisory Panel (Chair), Climate and Clean Air Coalition*

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Climate Action is but one Development Goal

 <p>TRANSFORMING OUR WORLD: THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT</p>	<p>1 NO POVERTY</p> 	<p>2 ZERO HUNGER</p> 	<p>3 GOOD HEALTH AND WELL-BEING</p> 	<p>4 QUALITY EDUCATION</p> 	<p>5 GENDER EQUALITY</p> 
<p>6 CLEAN WATER AND SANITATION</p> 	<p>7 AFFORDABLE AND CLEAN ENERGY</p> 	<p>8 DECENT WORK AND ECONOMIC GROWTH</p> 	<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p> 	<p>10 REDUCED INEQUALITIES</p> 	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> 
<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> 	<p>13 CLIMATE ACTION</p> 	<p>14 LIFE BELOW WATER</p> 	<p>15 LIFE ON LAND</p> 	<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p> 	<p>17 PARTNERSHIPS FOR THE GOALS</p> 

Climate Change Action is Moving Forward

Signatories of the Paris Agreement aim to hold

“the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels”

within *“the context of sustainable development and efforts to eradicate poverty”*

Climate Change Impacts

Climate change is already upon us, affecting health & well-being

Damages especially large for poorest populations

Some long-term impacts, e.g. sea-level rise & glacier melting, are cumulative

Hence urgent need to limit near-term climate change



Linking Climate Change and other Development Goals

Need to reduce climate change in near-term as well as long-term

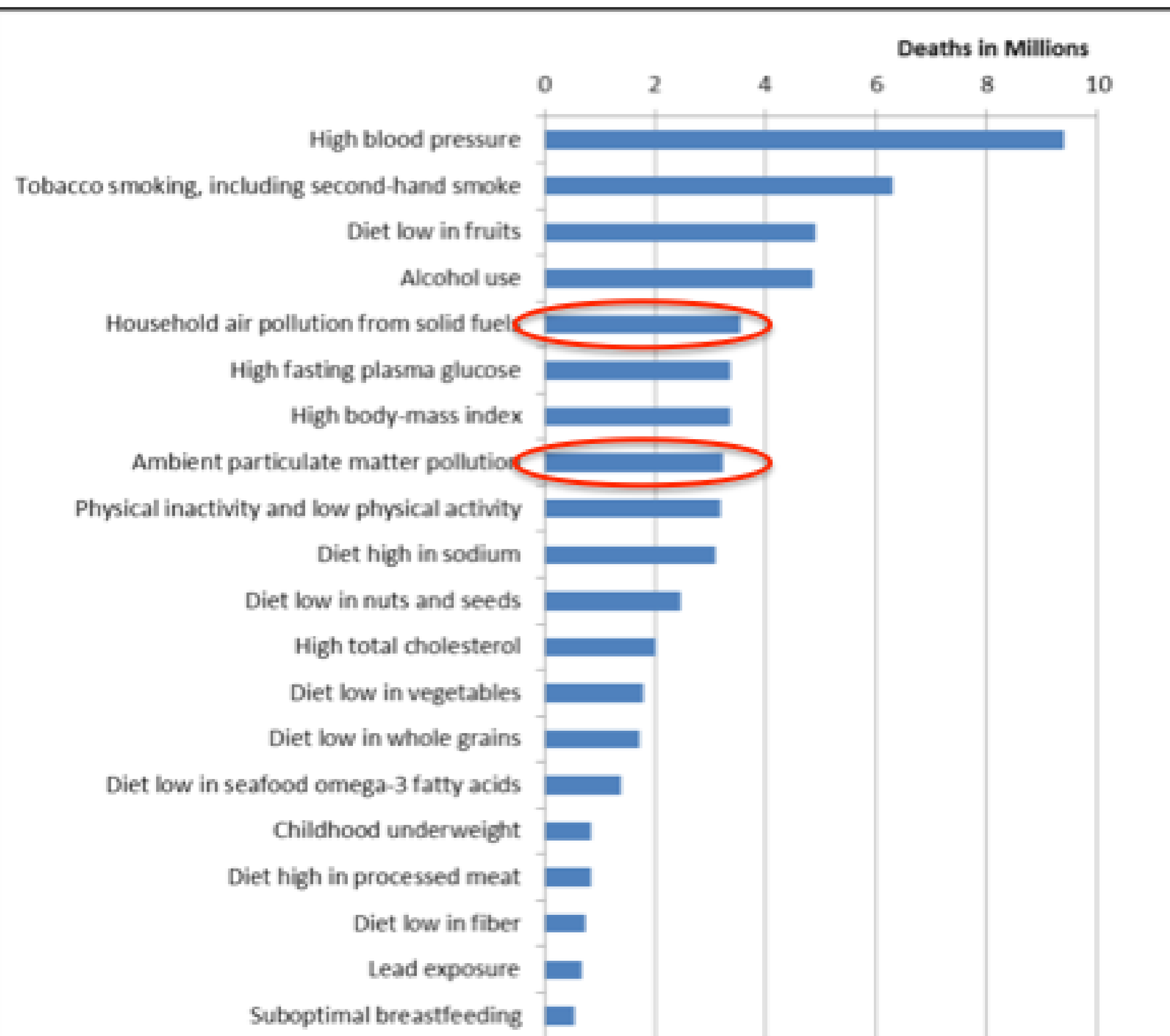
Need to reduce burden of air pollution

Need to feed a growing population

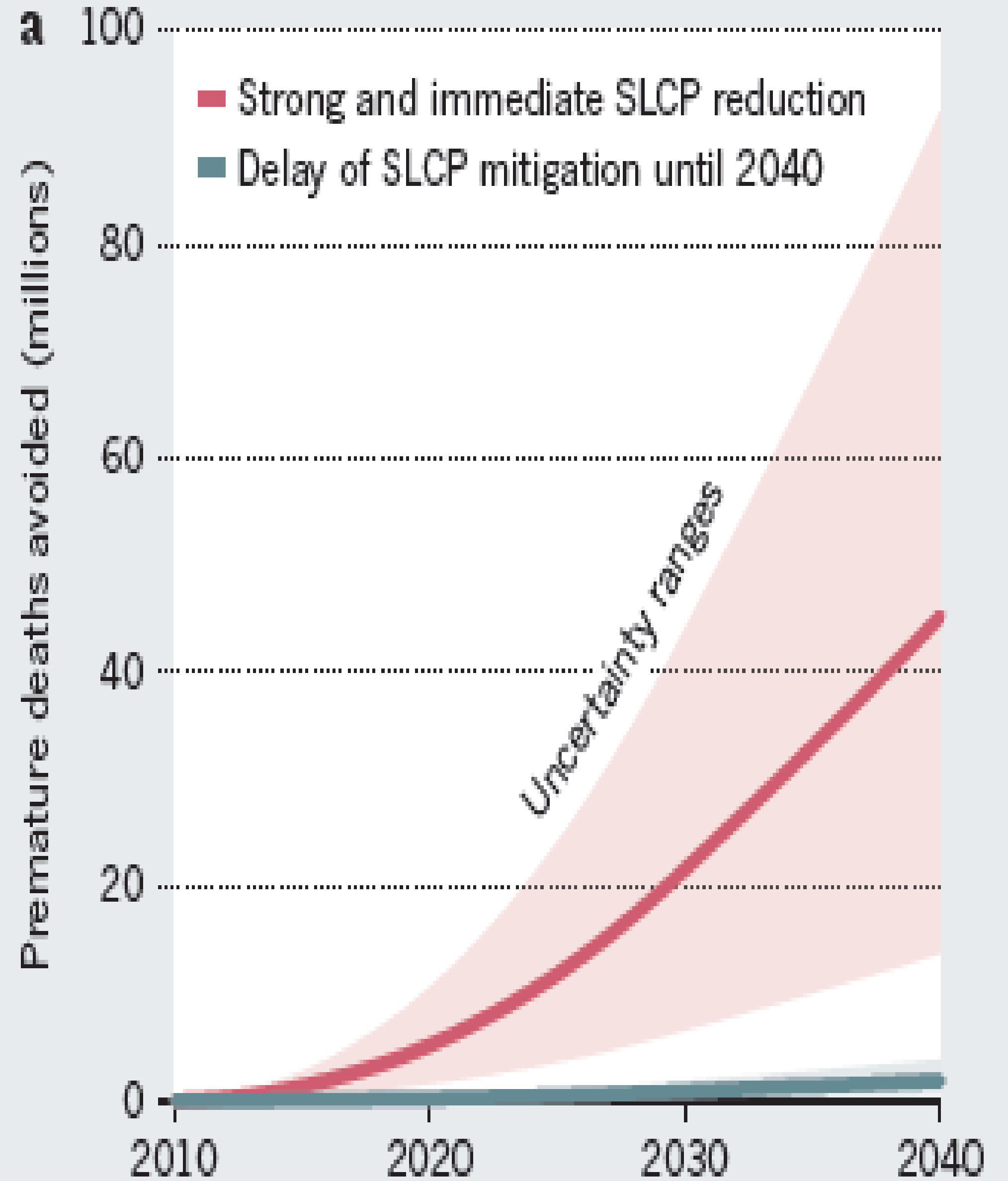
Emissions of short-lived climate pollutants affect all these factors

Public Health & SLCPs

Global Deaths Attributable to 20 Leading Risk Factors 2010

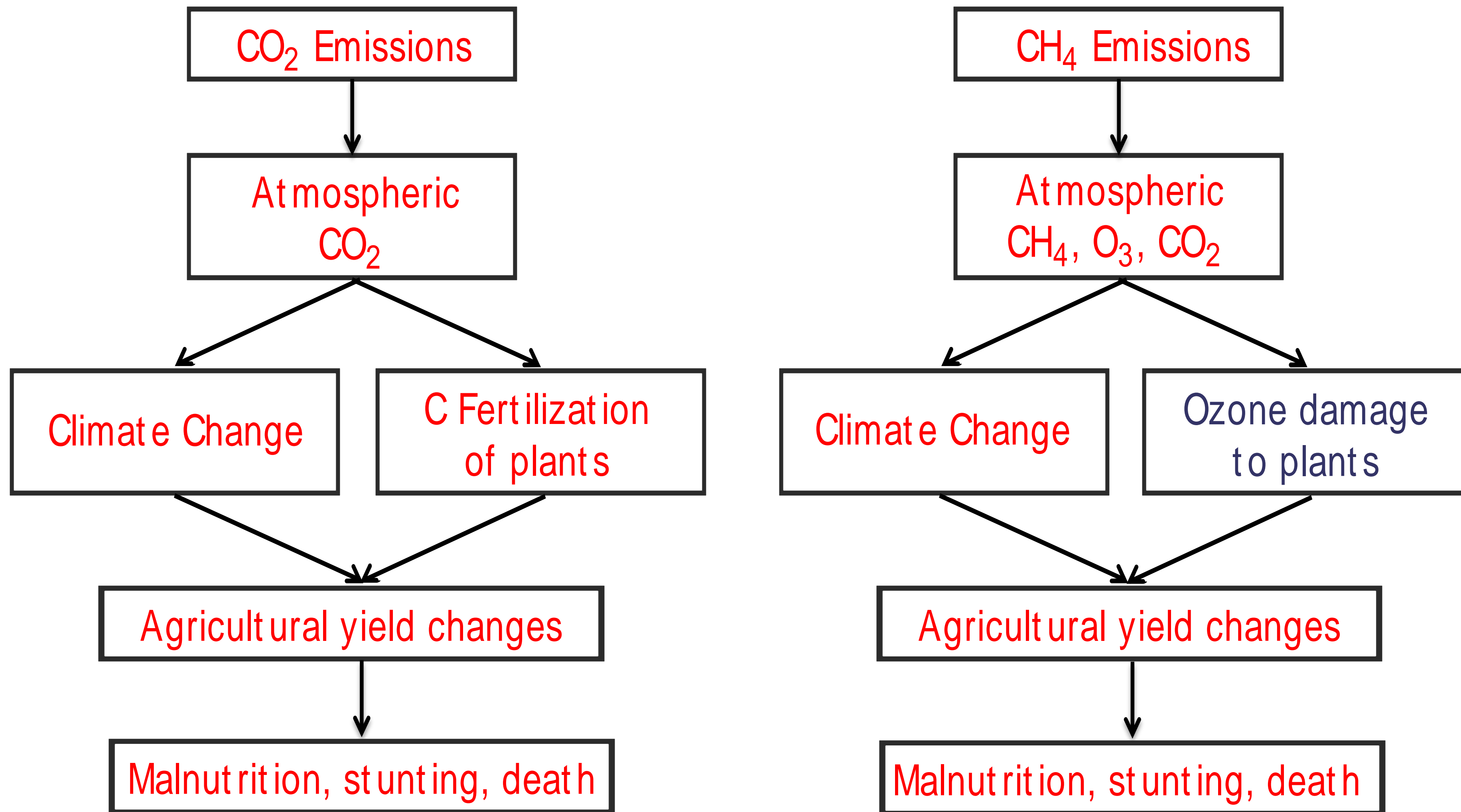


Global Burden of Disease, 2012



Schmale et al., Nature Climate Change, 2014

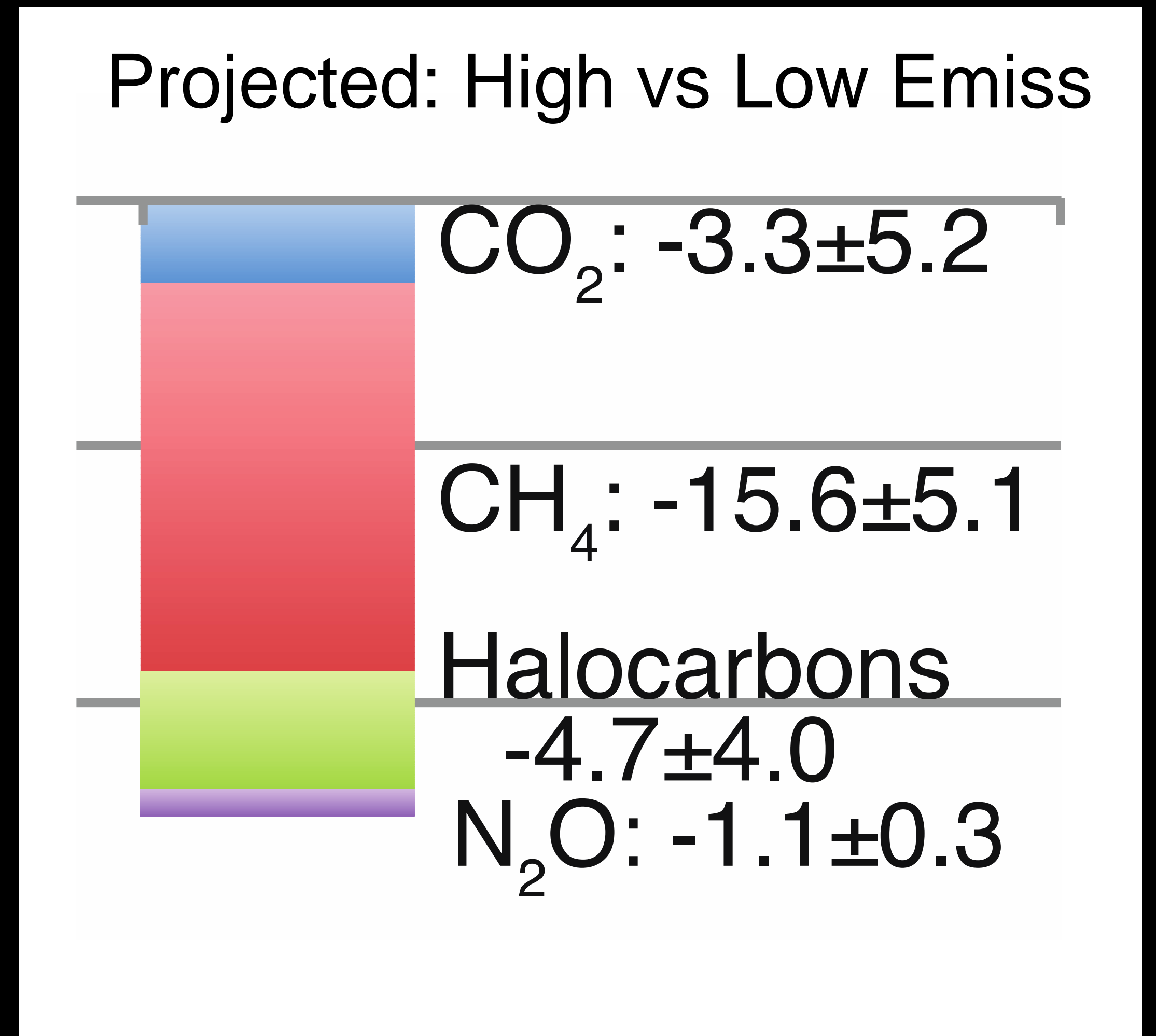
Agriculture & SLCPs



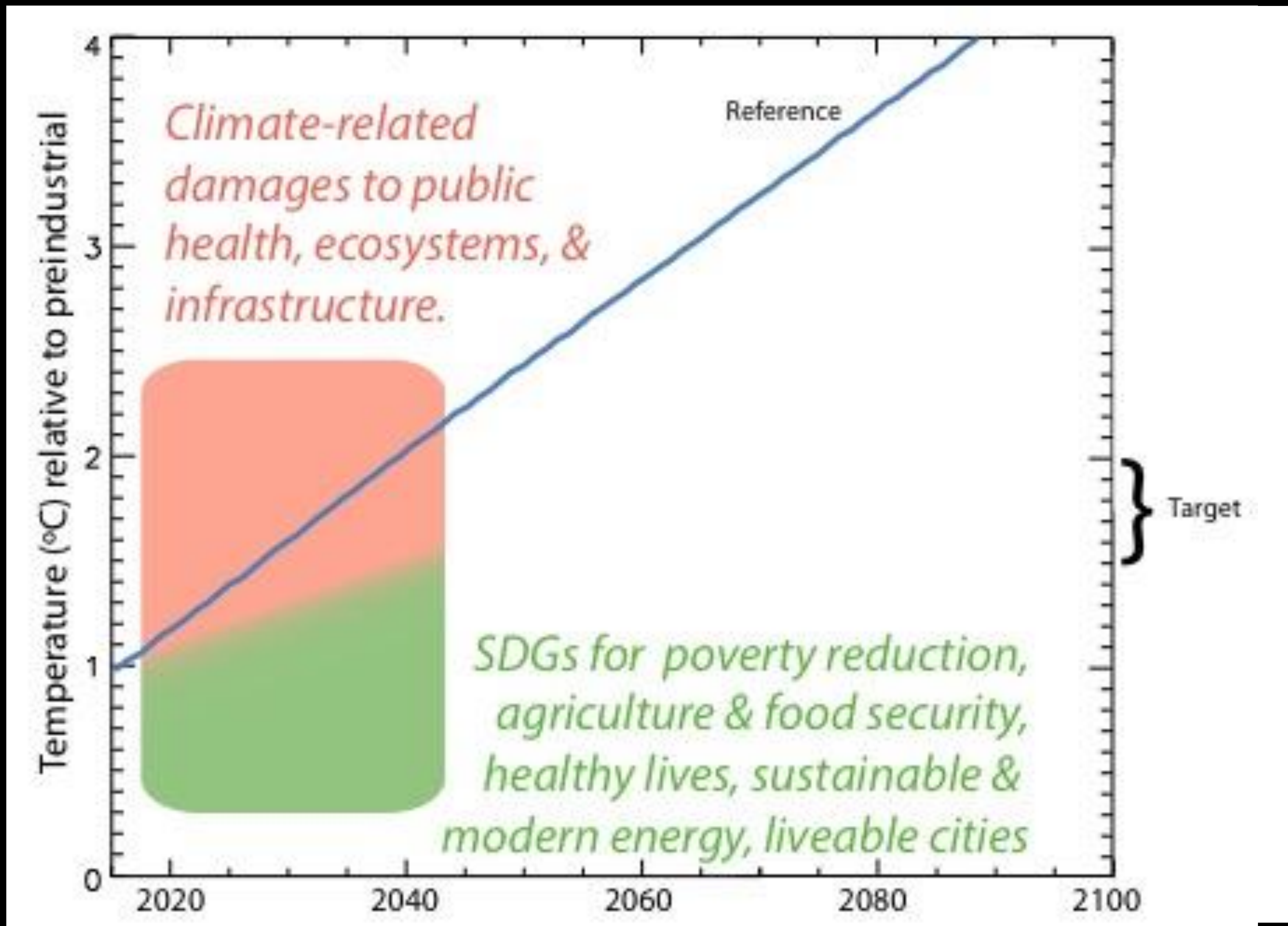
Methane ~7.5x impact of CO₂ to date on crop yields (Shindell, Earth's Future, 2016)

Agriculture & SLCPs

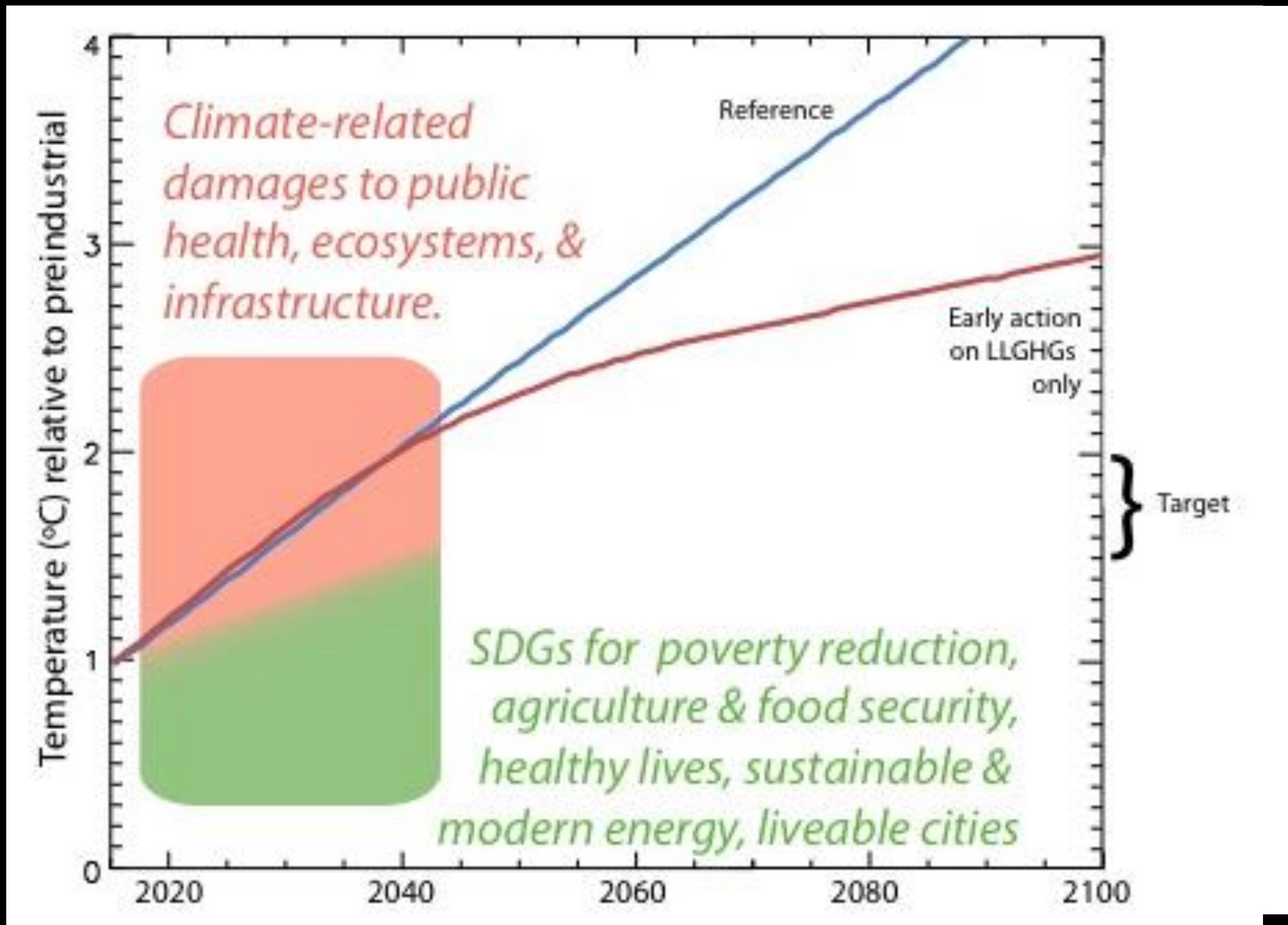
Factor	Response to CO2	Response to CH4
Heat	↓	↓
Drought	↓	↓
Fertilization	↑	-
Ozone	-	↓



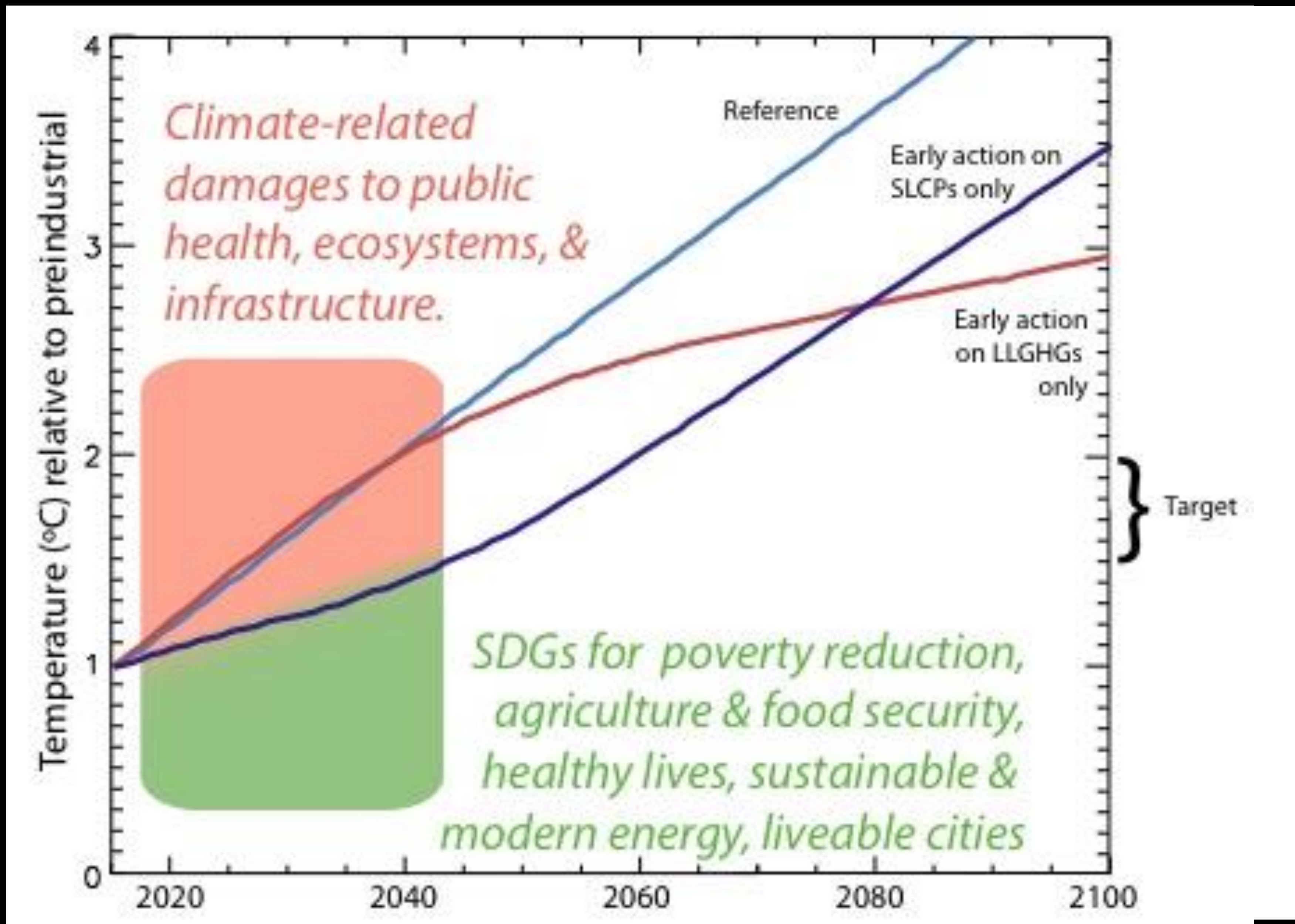
Why worry about the Pathway to the Targets



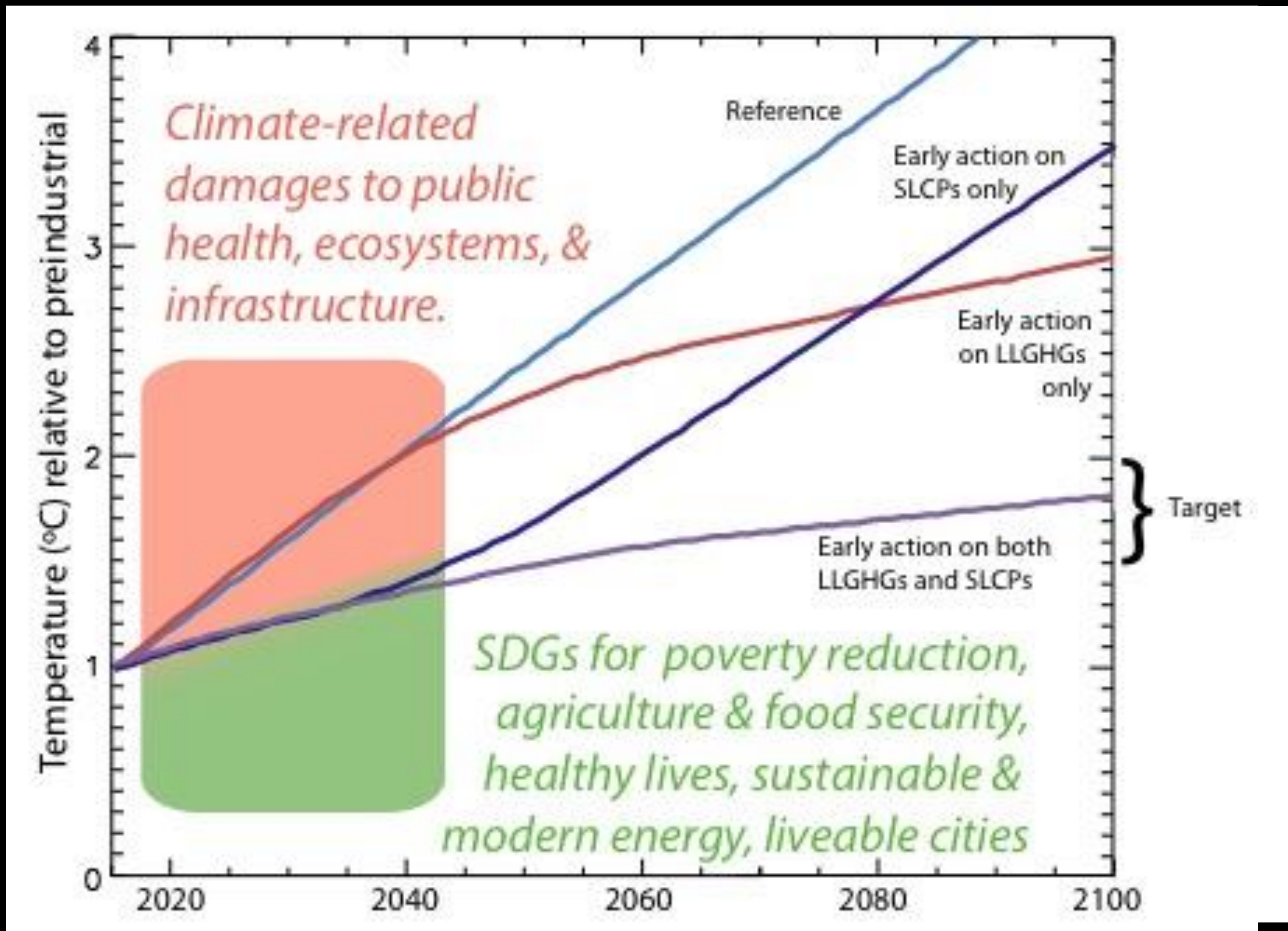
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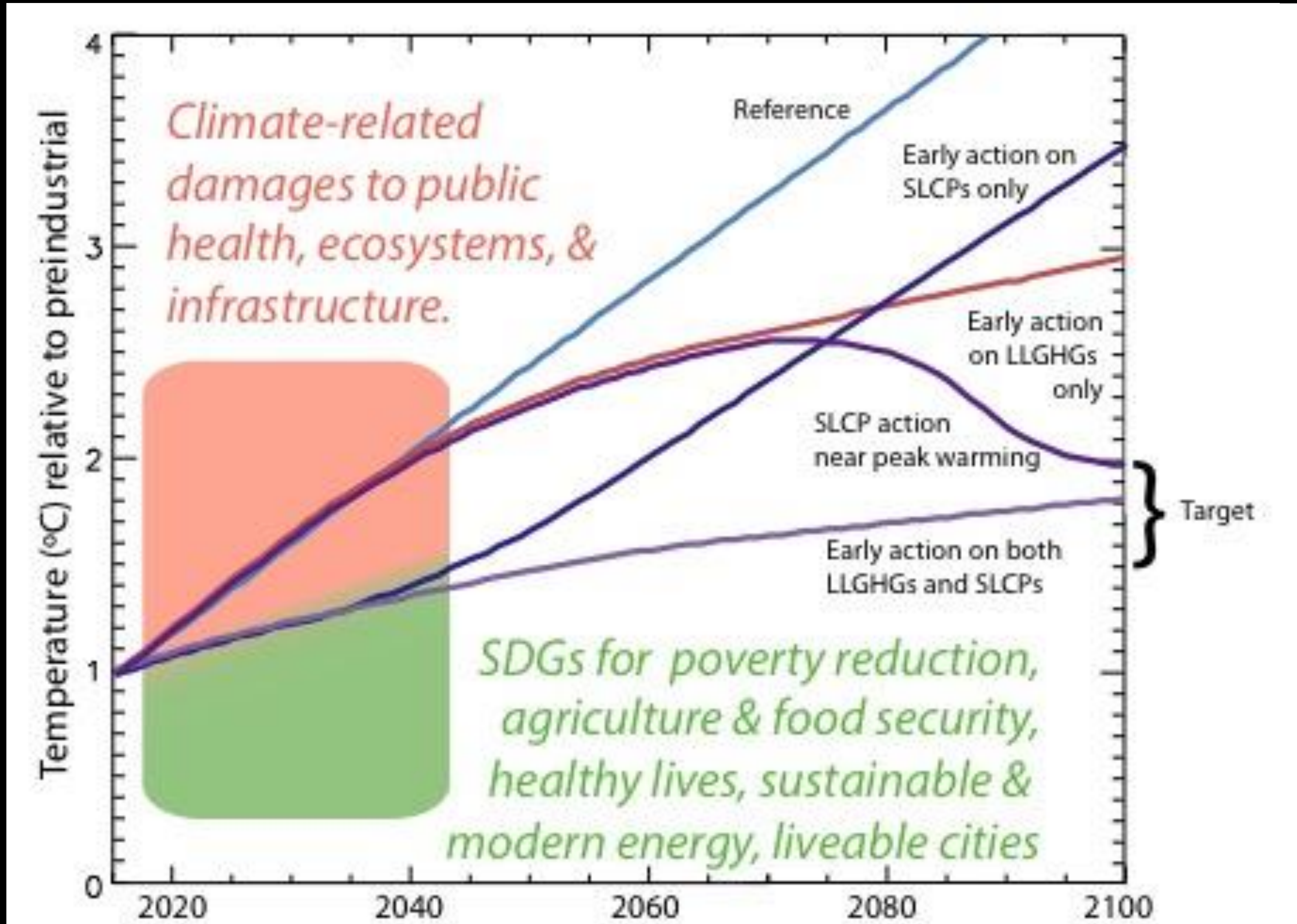
Why worry about the Pathway to the Targets



Why worry about the Pathway to the Targets



Why worry about the Pathway to the Targets



Consider the path to the target!

Additional Benefits of Action

- Biomass stoves
 - Time (women's employment, children's education)
 - Reduced deforestation



- Efficient kilns/coke ovens
 - Time & fuel (50%)



- Methane capture
 - Increased energy security



- Limit Agricultural Waste Burning

Policies affecting SLCPs inextricably link near-term climate, human health, agriculture and sustainable development

The Pathway to the Target

Keep current long-term target

Add goal of slowing global warming during next 25 years by half

Would require reducing BC-related emissions ~75%, anthropogenic methane ~25%, eliminating growth in HFCs by 2030

New goal addresses near-term impacts, pace of change, and climate-SDGs link

How Controlling the Pathway could lead to a better world

Large public health and agricultural benefits for current generations, especially women, children and the poor

Reduced damages from climate change during the next few decades

Reduced damages from cumulative effects such as sea-level rise on future generations

Synergy with long-term climate goal: Political good-will from tangible, rapid benefits of clean air; Enable achievement of targets without strong overshoot

Metrics: Definitions

Emissions (e.g. kg y^{-1})

Emissions metrics (e.g. impact tonne^{-1})

Exposure metrics (e.g. $\text{pollution concentration d}^{-1}$)

Impact metrics (e.g. climate, air quality-related impacts)

Valuation metrics (e.g. US\$)

Metrics

Emissions
Day 2

Emissions metrics

SAP endorsed AGTP (no CO₂e!); Mean AGTP25 & AGTP100

Exposure metrics

annual PM_{2.5}; several for ozone

Impact metrics

Climate: dT; Health: prem. deaths/YLL; Crops: tons/% yield

Valuation metrics