REBOOT DEVELOPMENT

The Economics of a Livable Planet

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Jason Russ, and Esha Zaveri

Enormous economic progress over the 20th and 21st centuries on almost every economic indicator:

40% → 9%

Extreme Poverty

↓ 70%

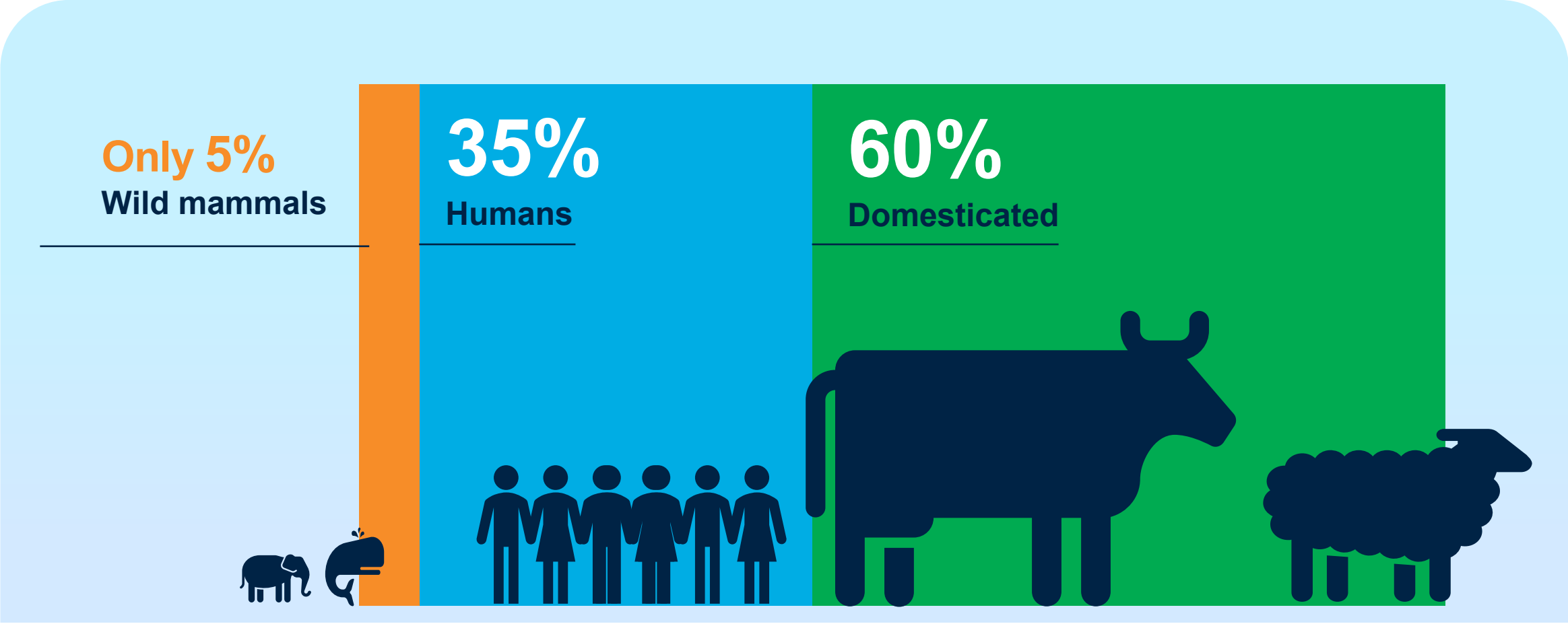
Infant Mortality

>70%

Access to Electricity & Water

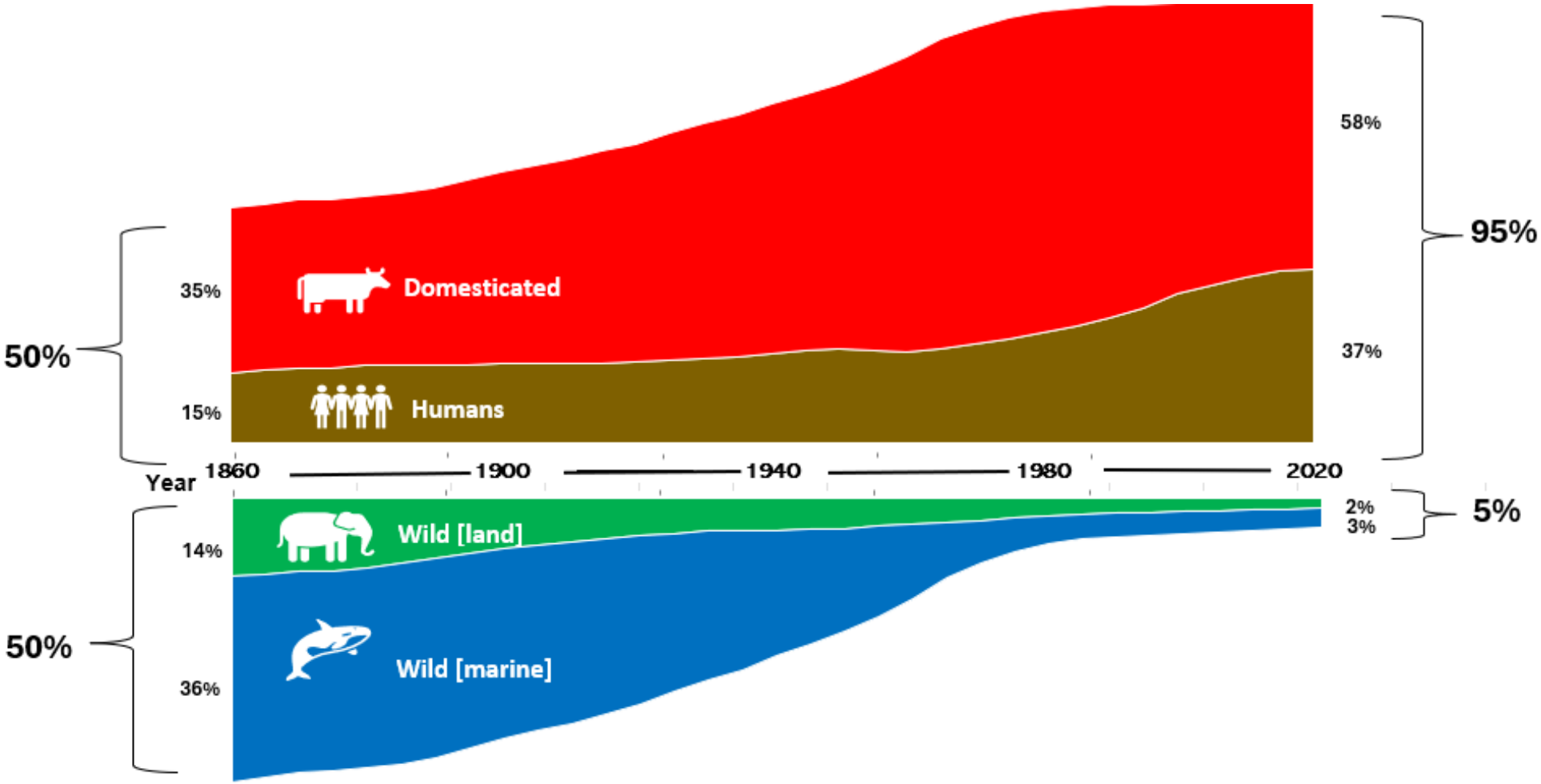

…….. at a price

The Indelible Footprint: Humanity's Journey vis-à-vis Nature



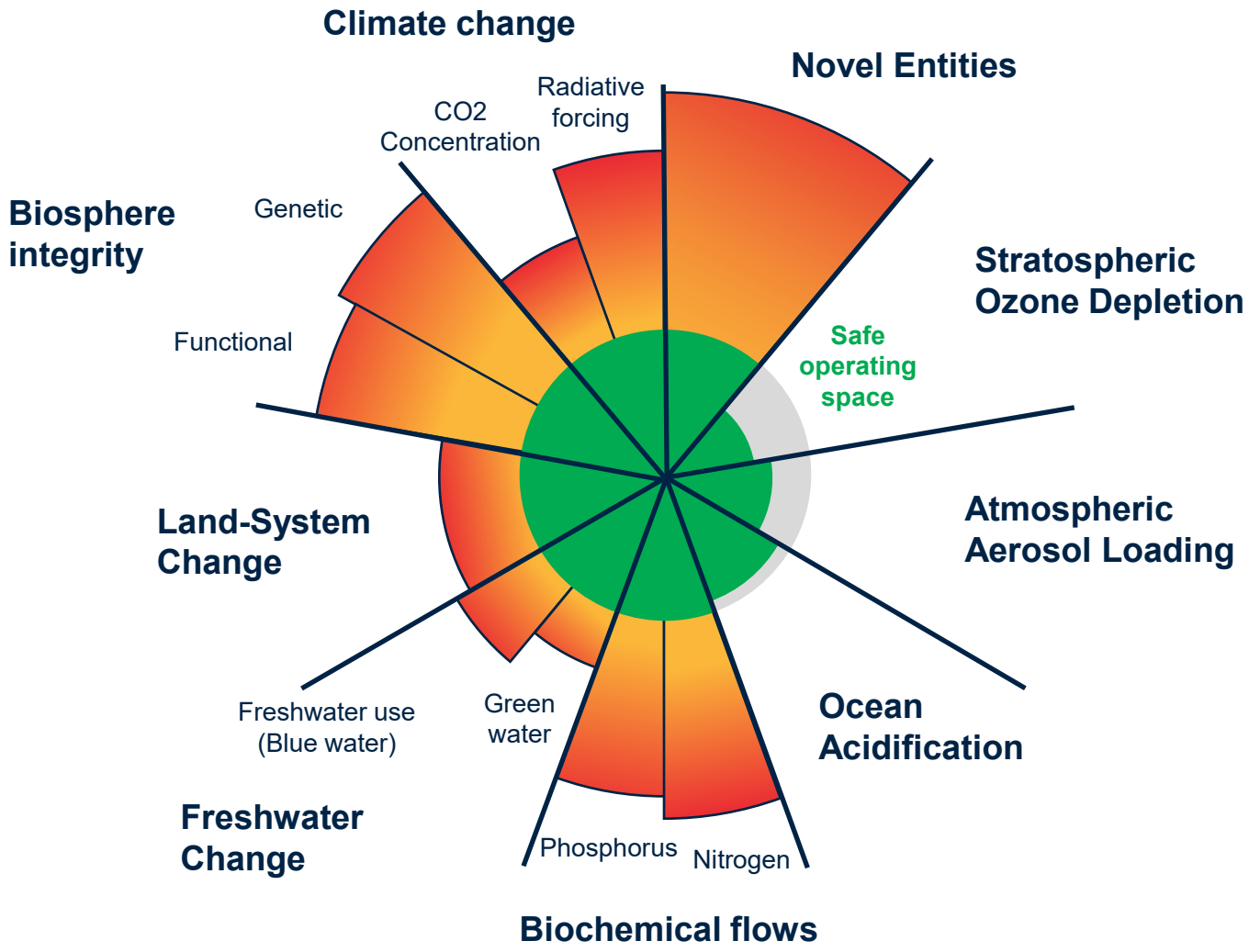
Mammalian biomass by % Source Greenspoon et al forthcoming(Nature)

The Indelible Footprint: Humanity's Journey vis-à-vis Nature



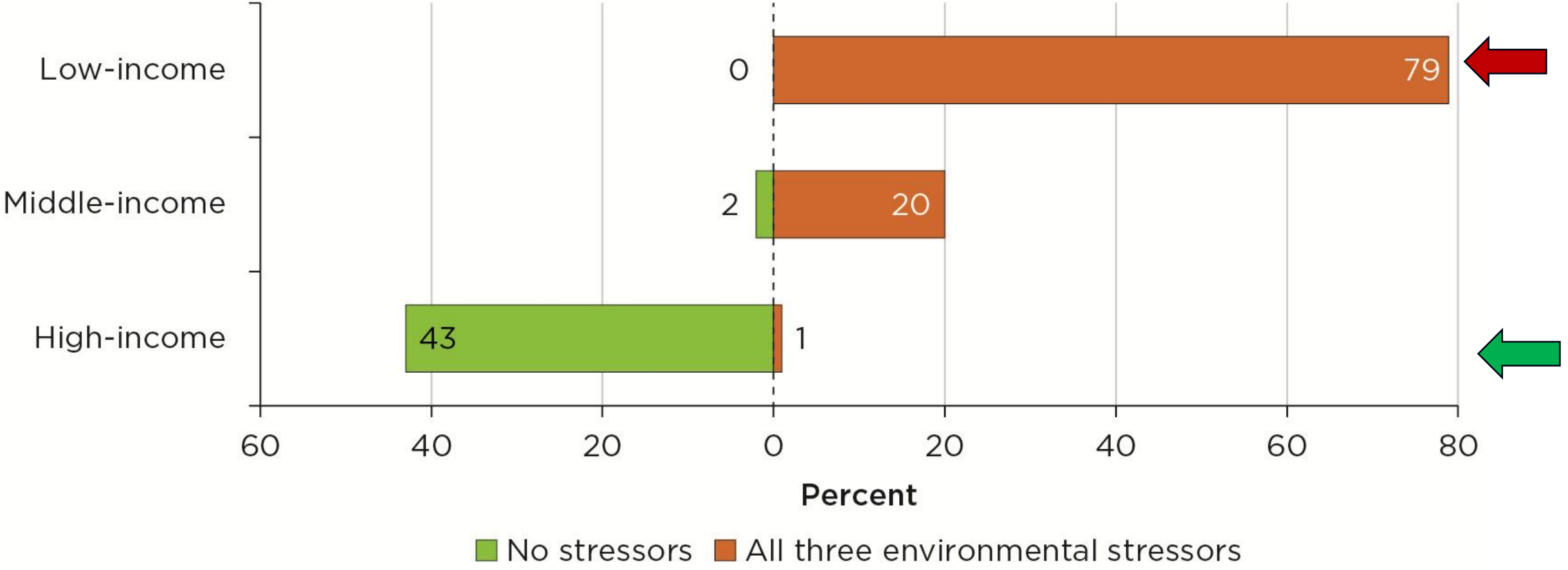
Wild mammal biomass has plummeted while human impacts have soared

Earth Systems: 6 of 9 Planetary Boundaries Have Been Crossed




Who is impacted (most)?

Who is exposed to 3 critical stressors: Air pollution, land degradation and water stress?




Land – water linkages

Where does the rain *come from*?

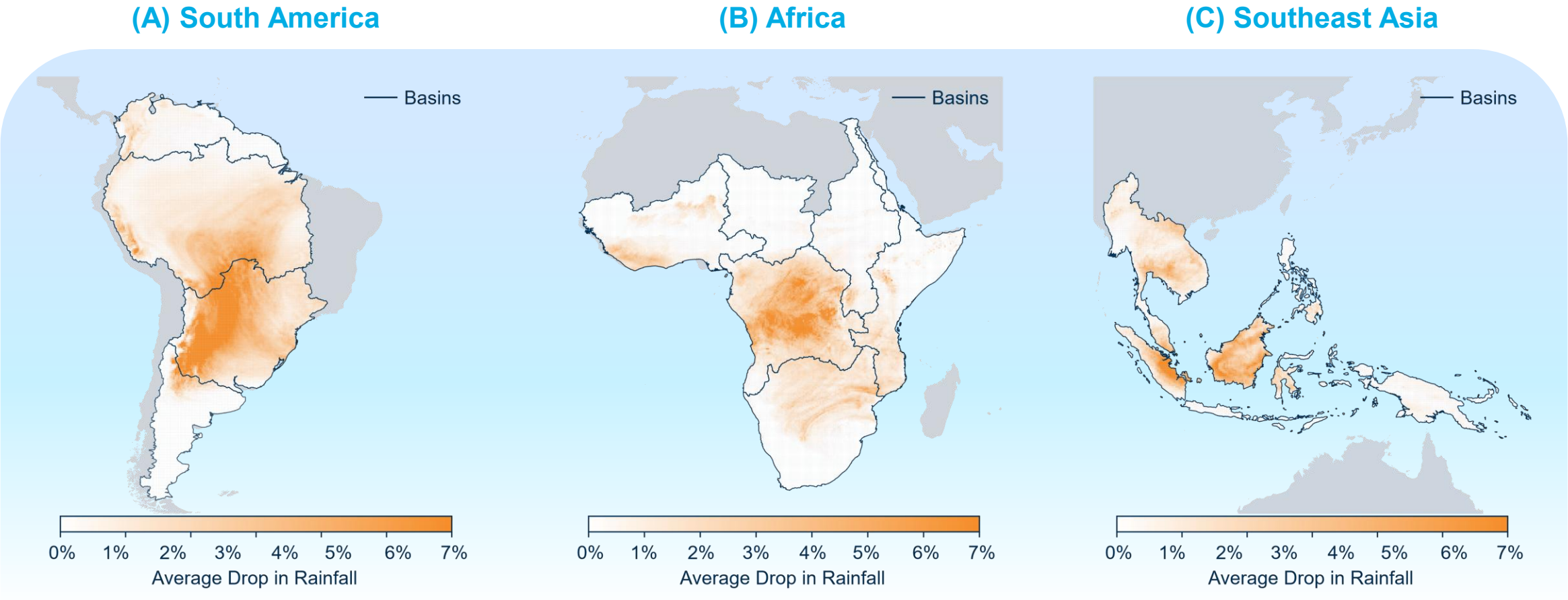
~53%

from oceans

~47%

from land (forests)

Rainfall loss due to deforestation (2001 – 2020)



Where does the rain go (“partitioning”)?

~65%

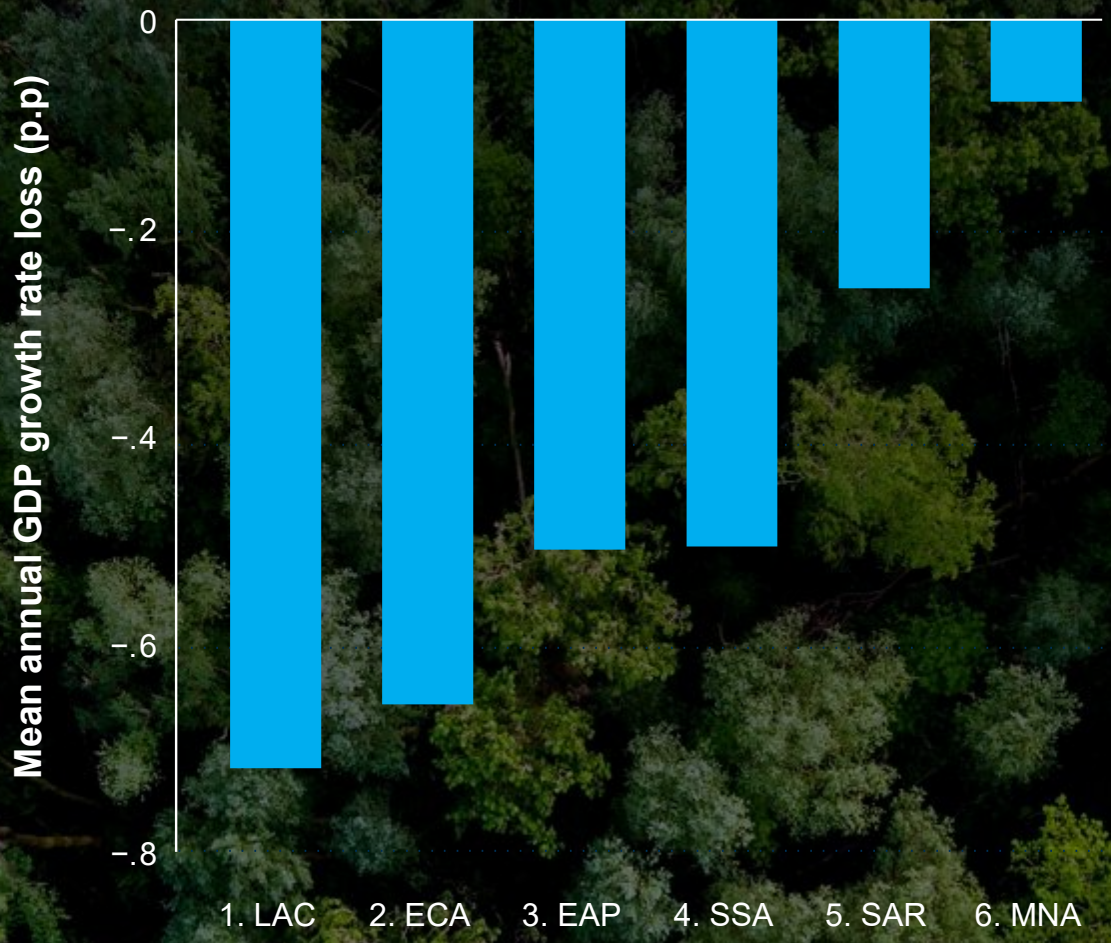
is soil moisture

~35%

is held in rivers, lakes, ground water, glaciers and ice

Forests - as sponges

Forests → Soil Moisture → Yields → GDP growth



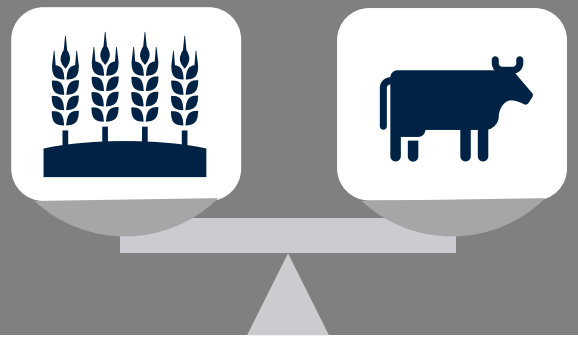
Can we decouple growth from environmental damage?

1 SCALE

A bigger economy uses and pollutes more

2 COMPOSITION

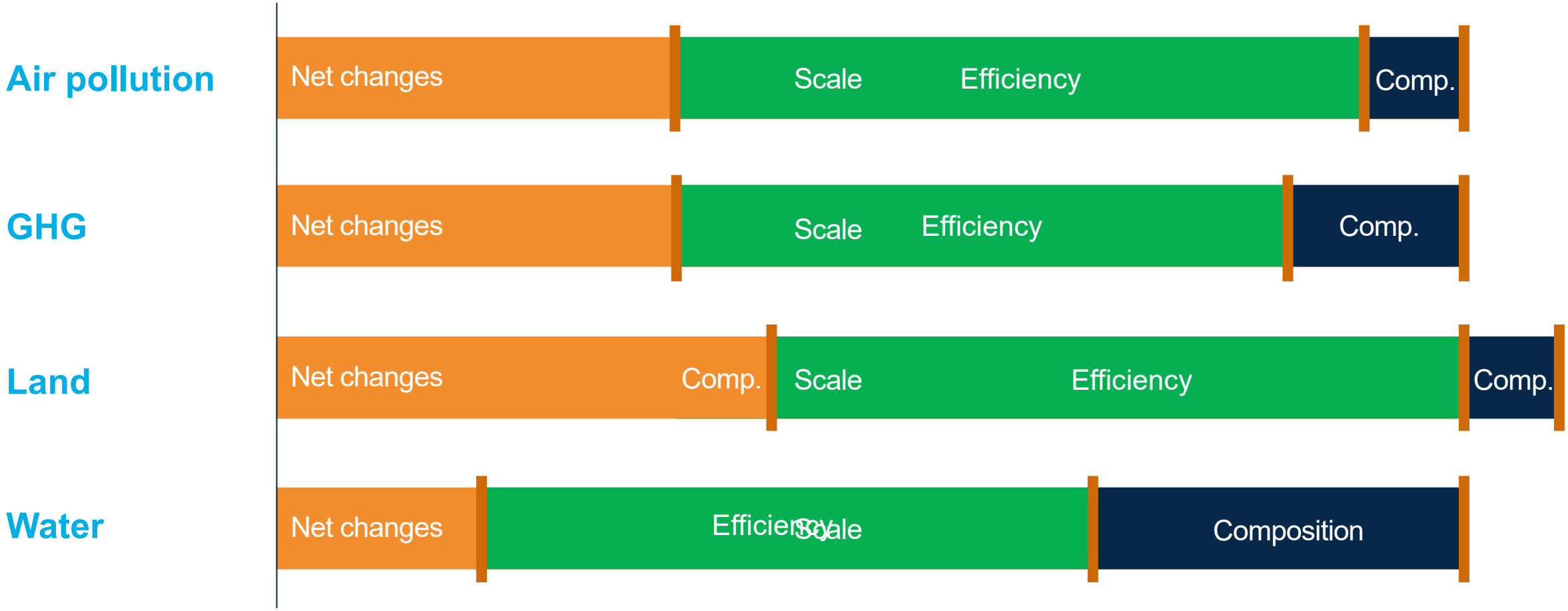
What we produce matters



3 EFFICIENCY

How we produce matters

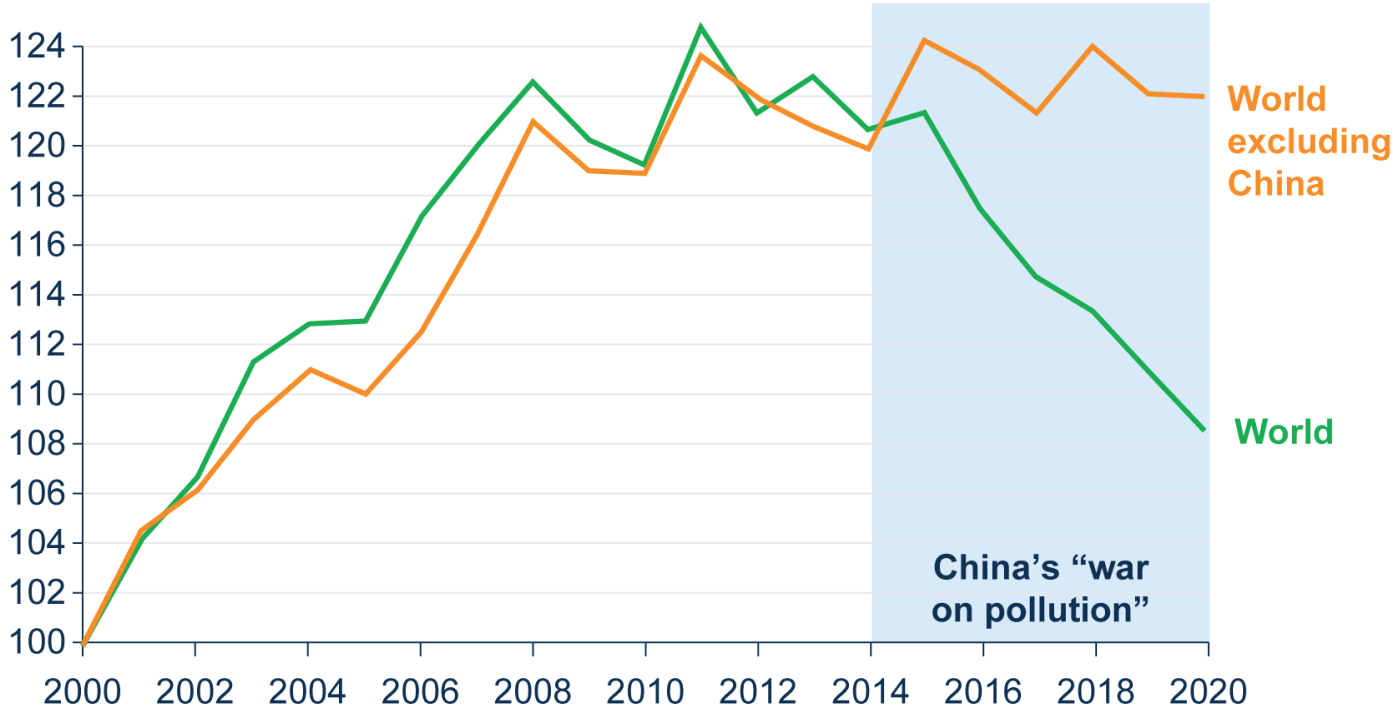
Decomposition of Environment Footprints



Air Pollution Exposure

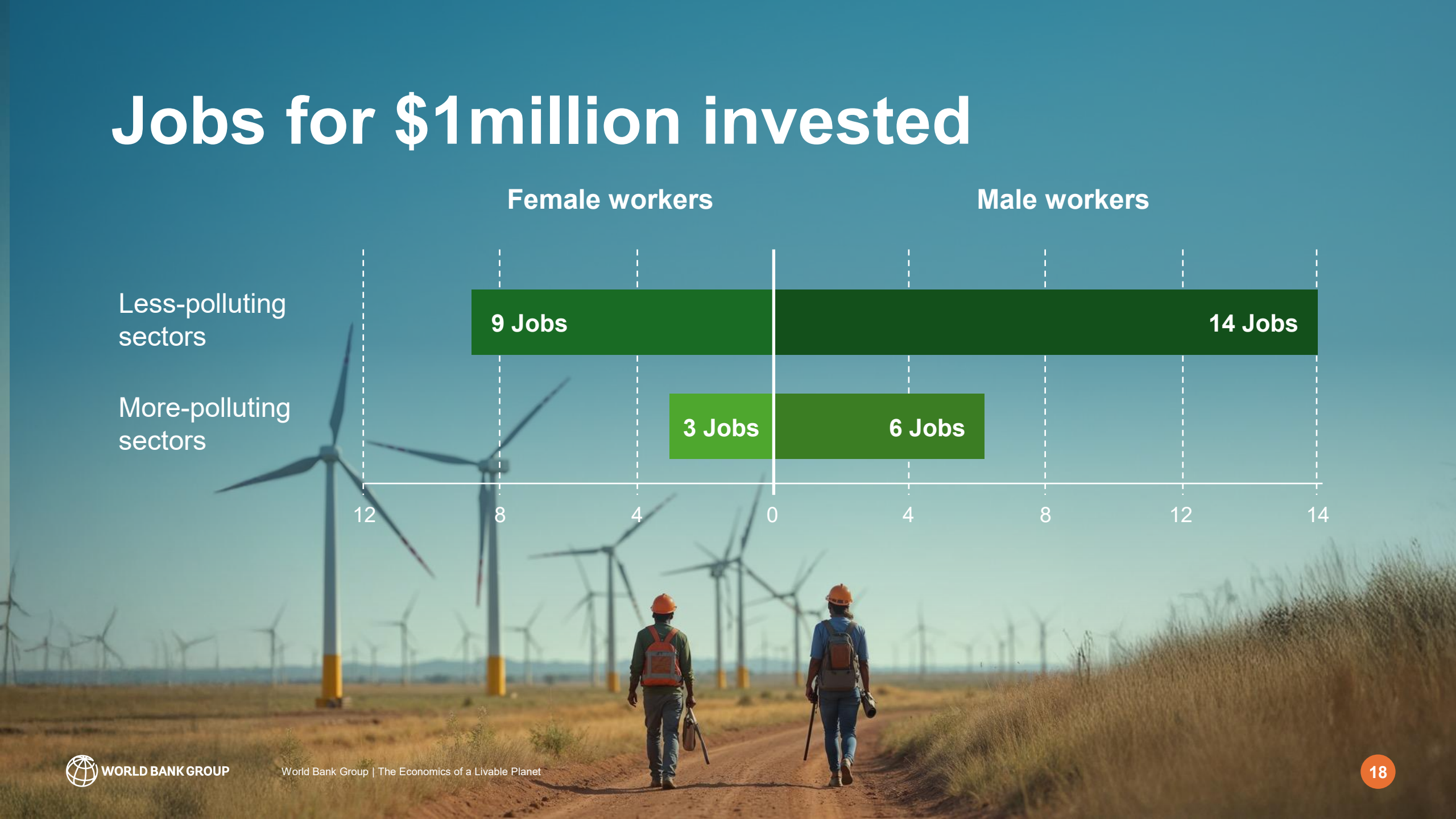
It is possible to reduce air pollution ($PM_{2.5}$) while growing the economy

Population-weighted $PM_{2,5}$ concentrations (indexed to 2000)



Source: World Bank staff calculations, using data EPR (Vogt et al., 2015), IPUMS International (Ruggles et al., 2024), Jones et al. 2023, van Donkelaar et al. 2016, and Bai et al. forthcoming

Jobs for $1million invested



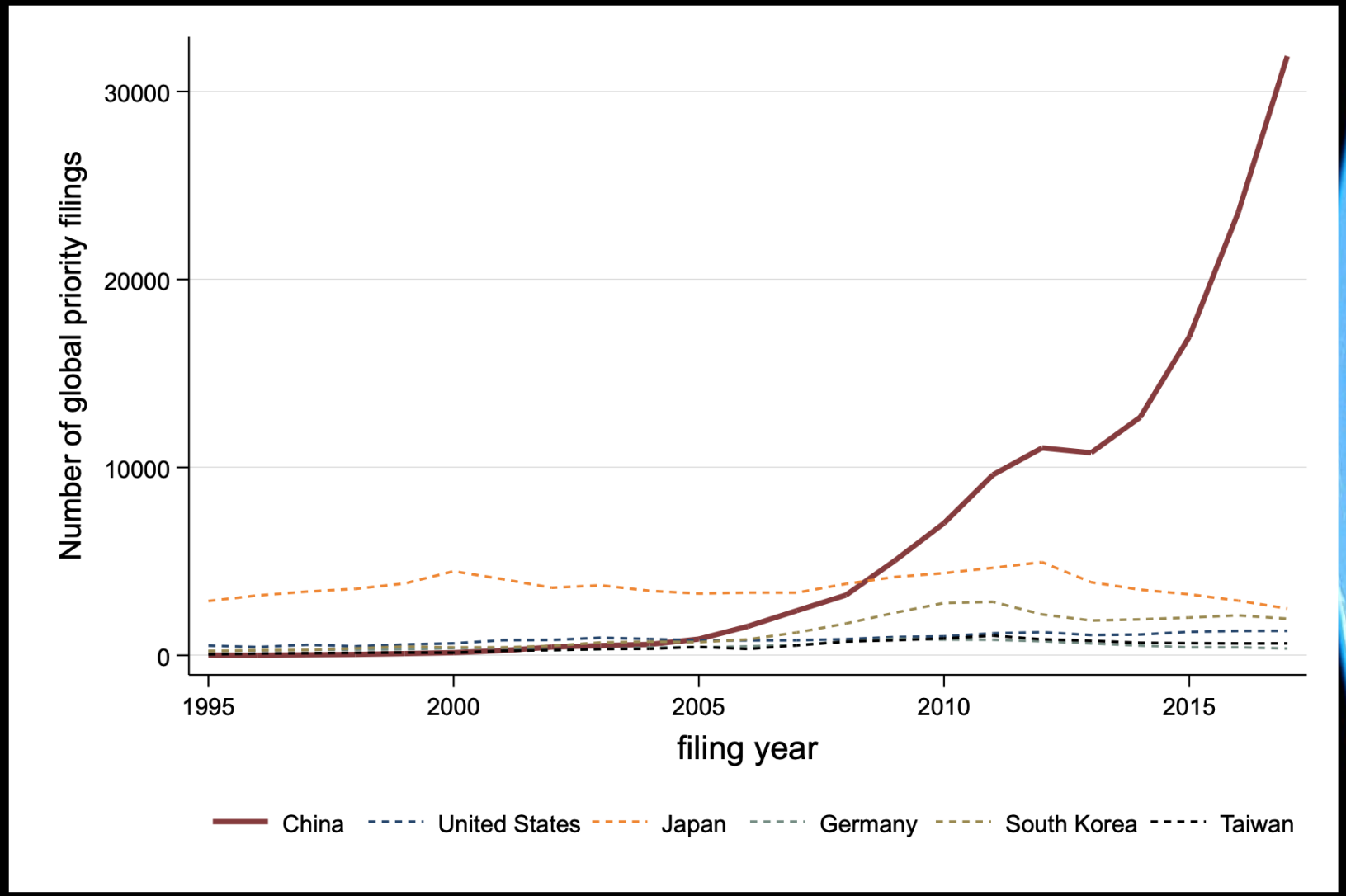

Valley of Death
The gap where ideas fail to scale

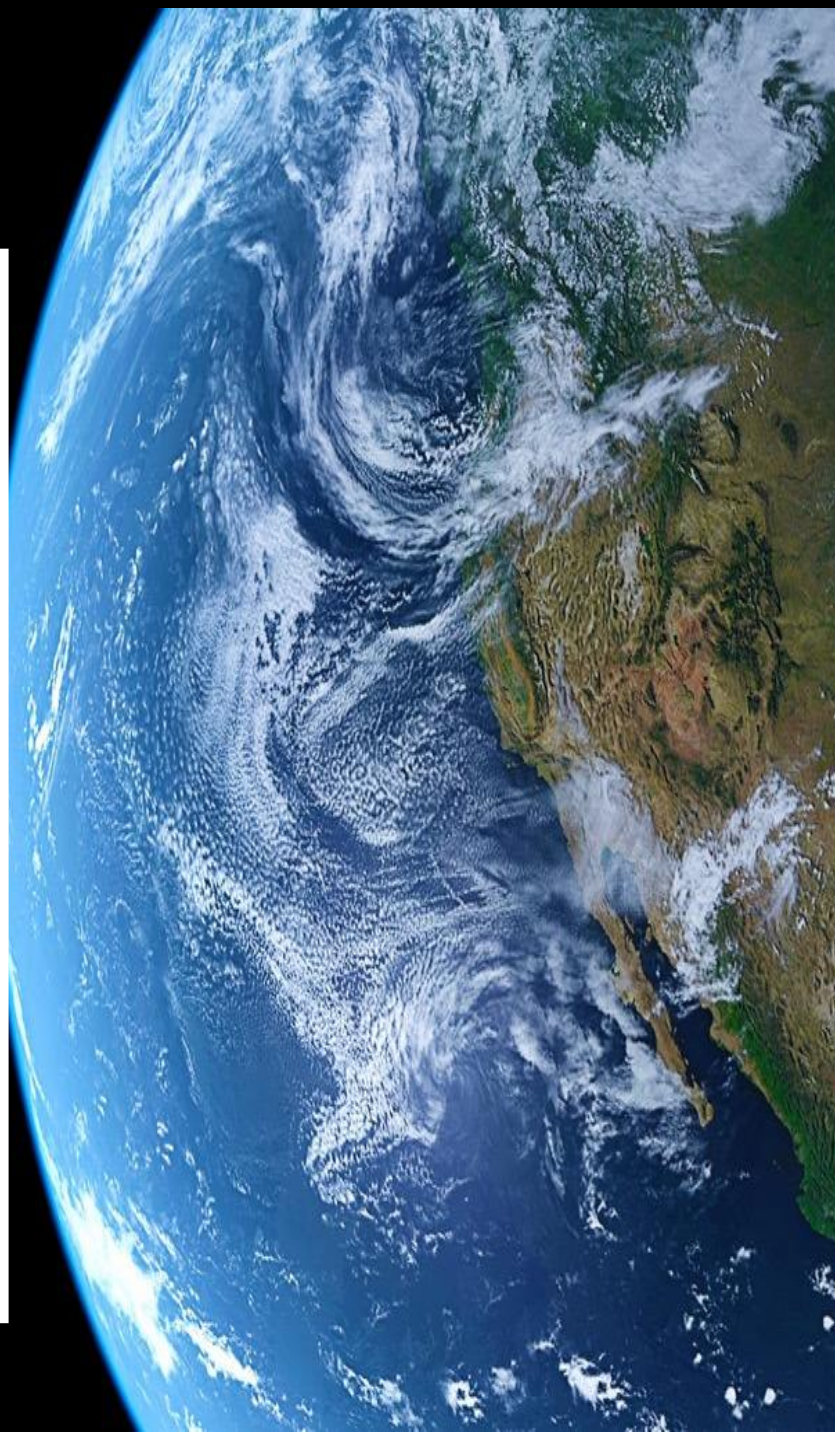
What kind of support is most appropriate?

Demand side (lower price to consumer)

Supply side (process innovation and product innovation)

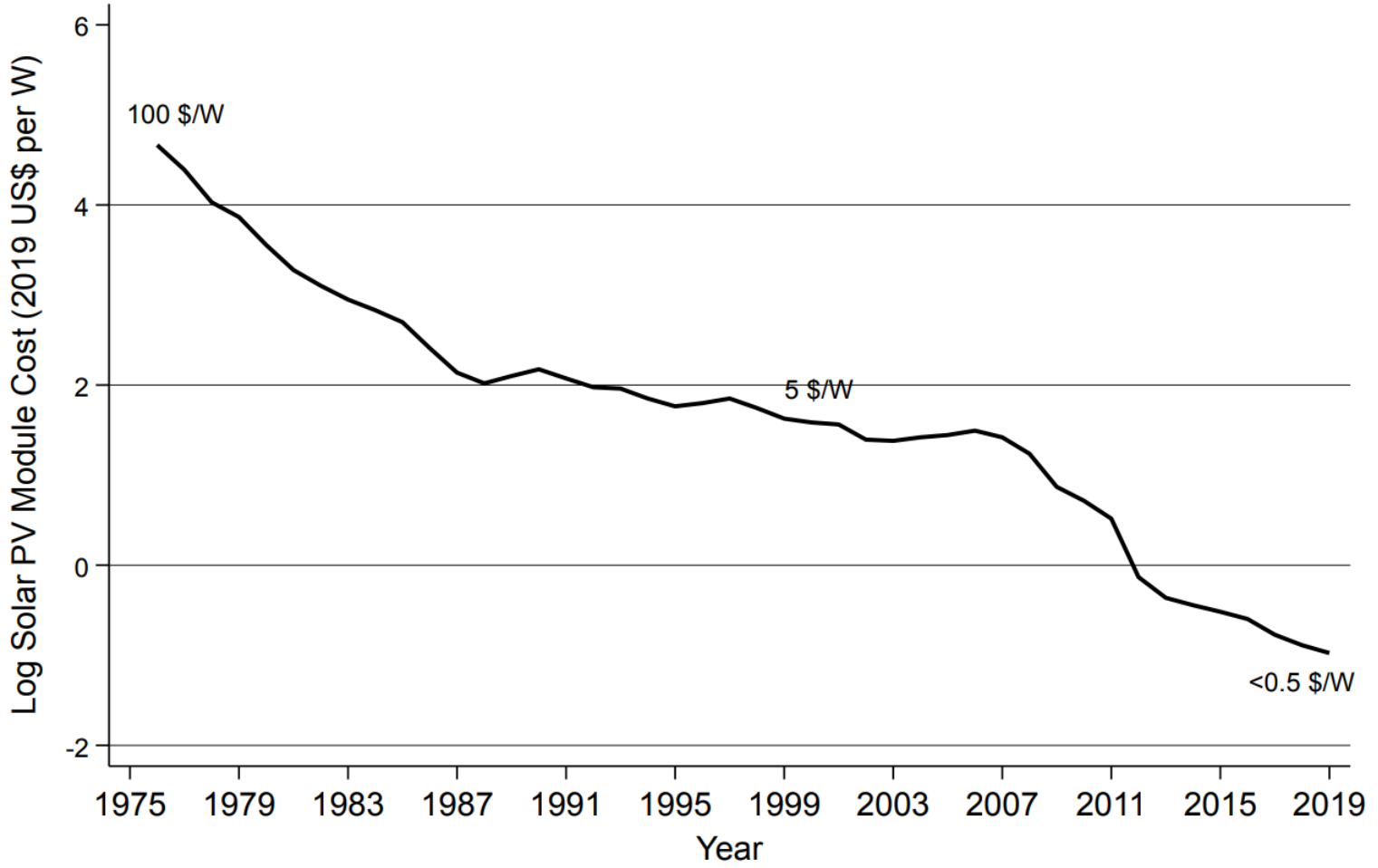
Innovation -> solar patents fillings

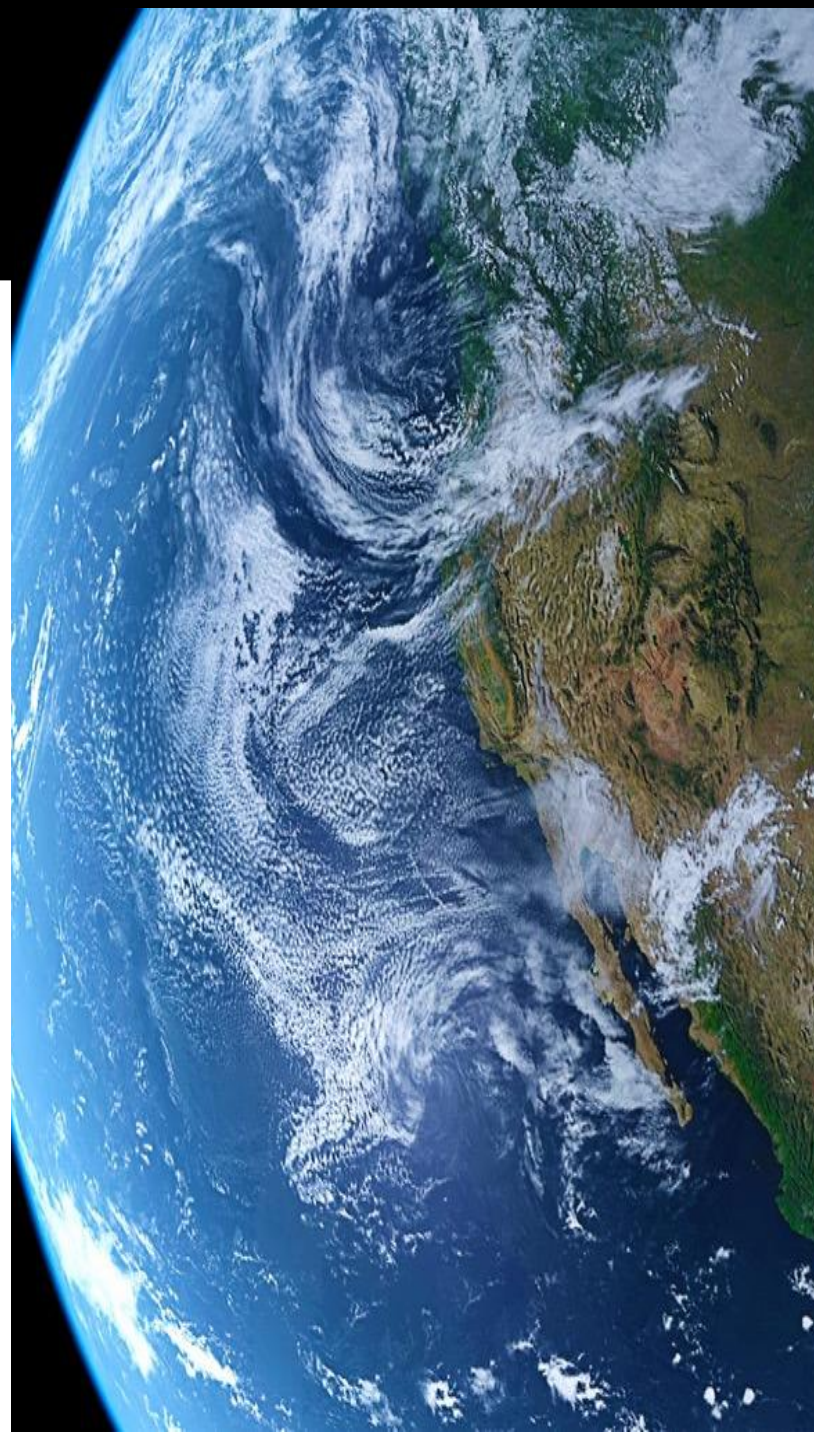




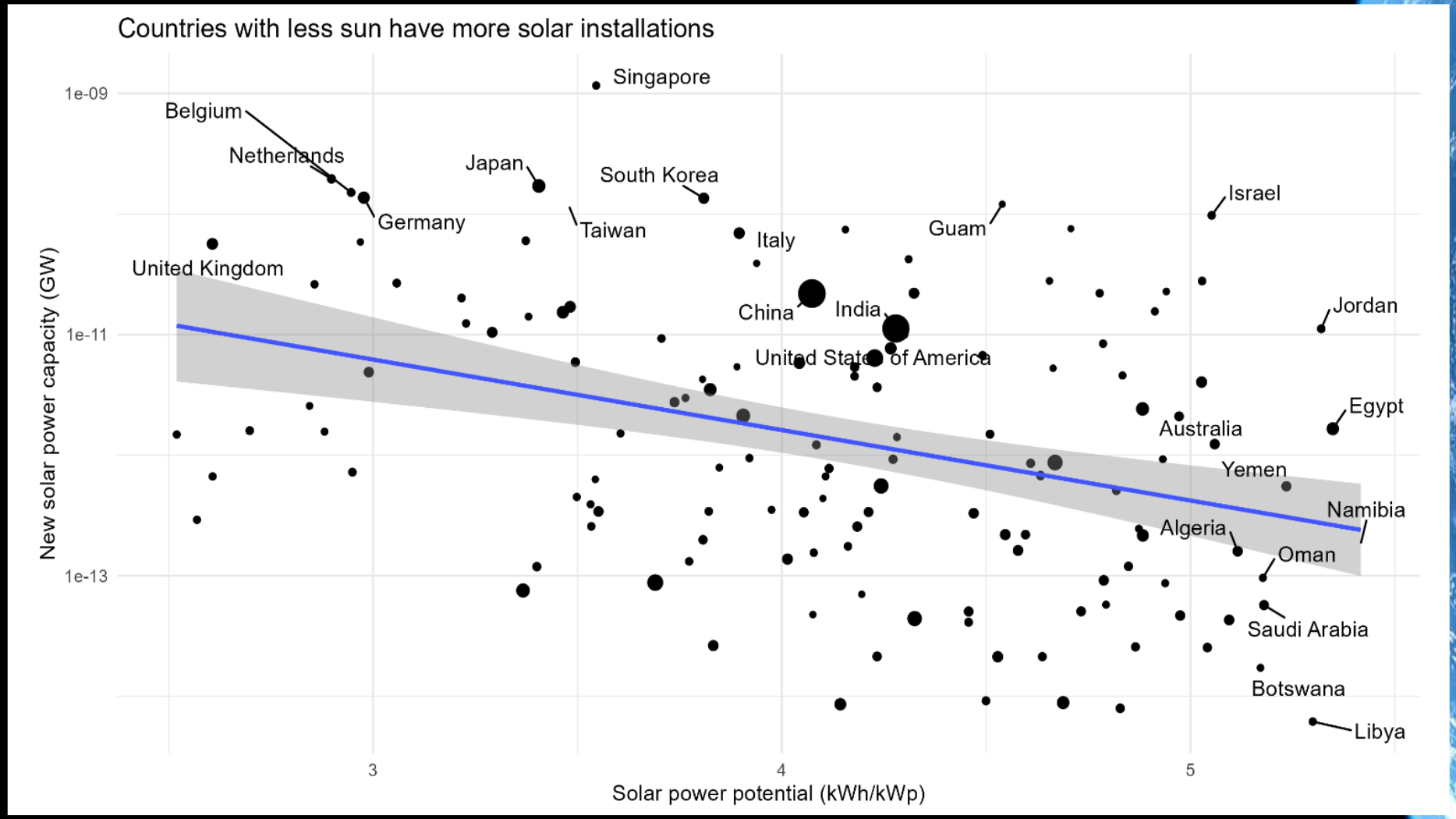
Innovation -> Price of PV modules

Figure: Global average price of solar PV modules (in 2019 US$ per Watt)





Diffusion – challenge remains



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Thank You

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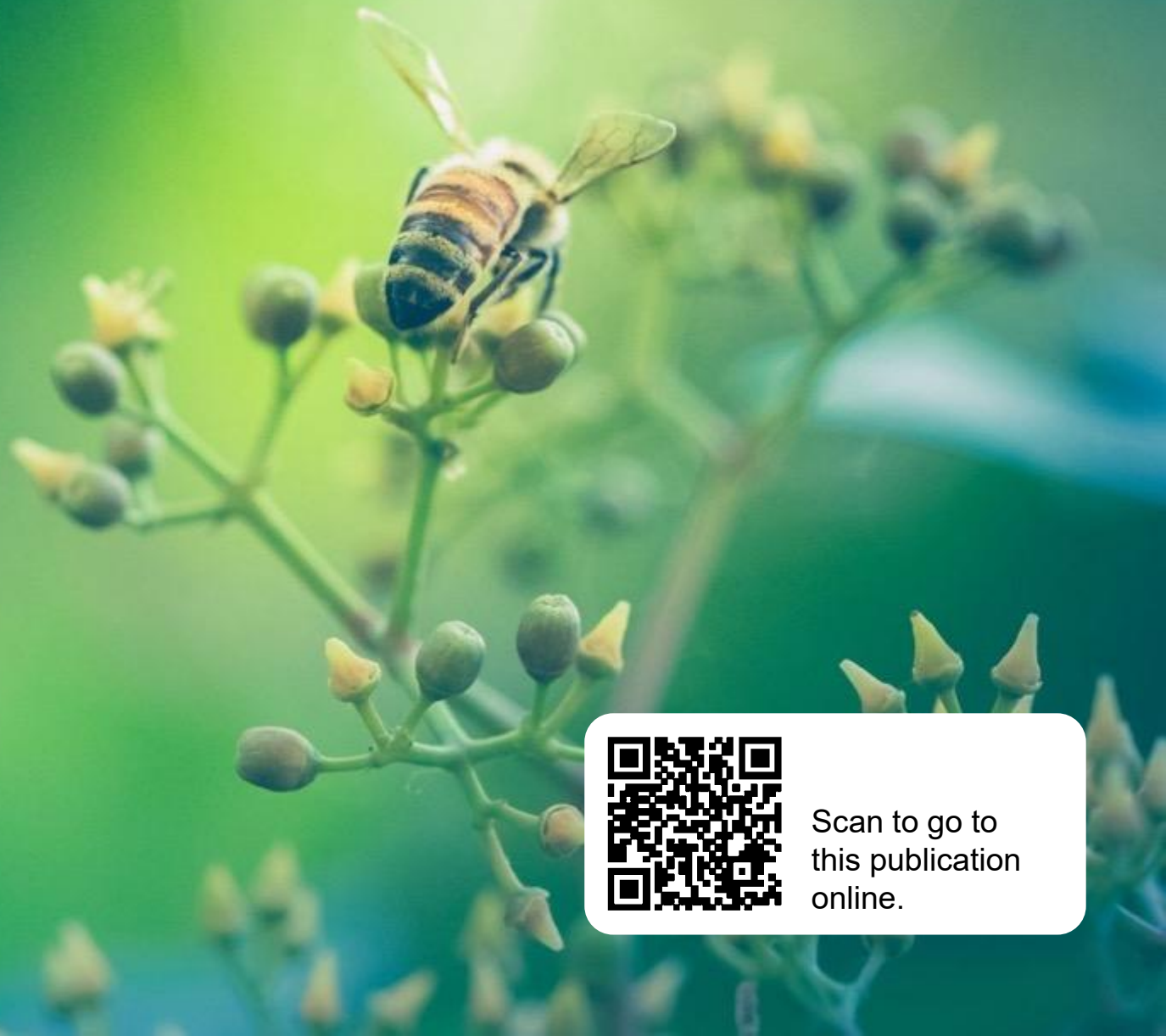

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