Just transitions and climate change

Introduction

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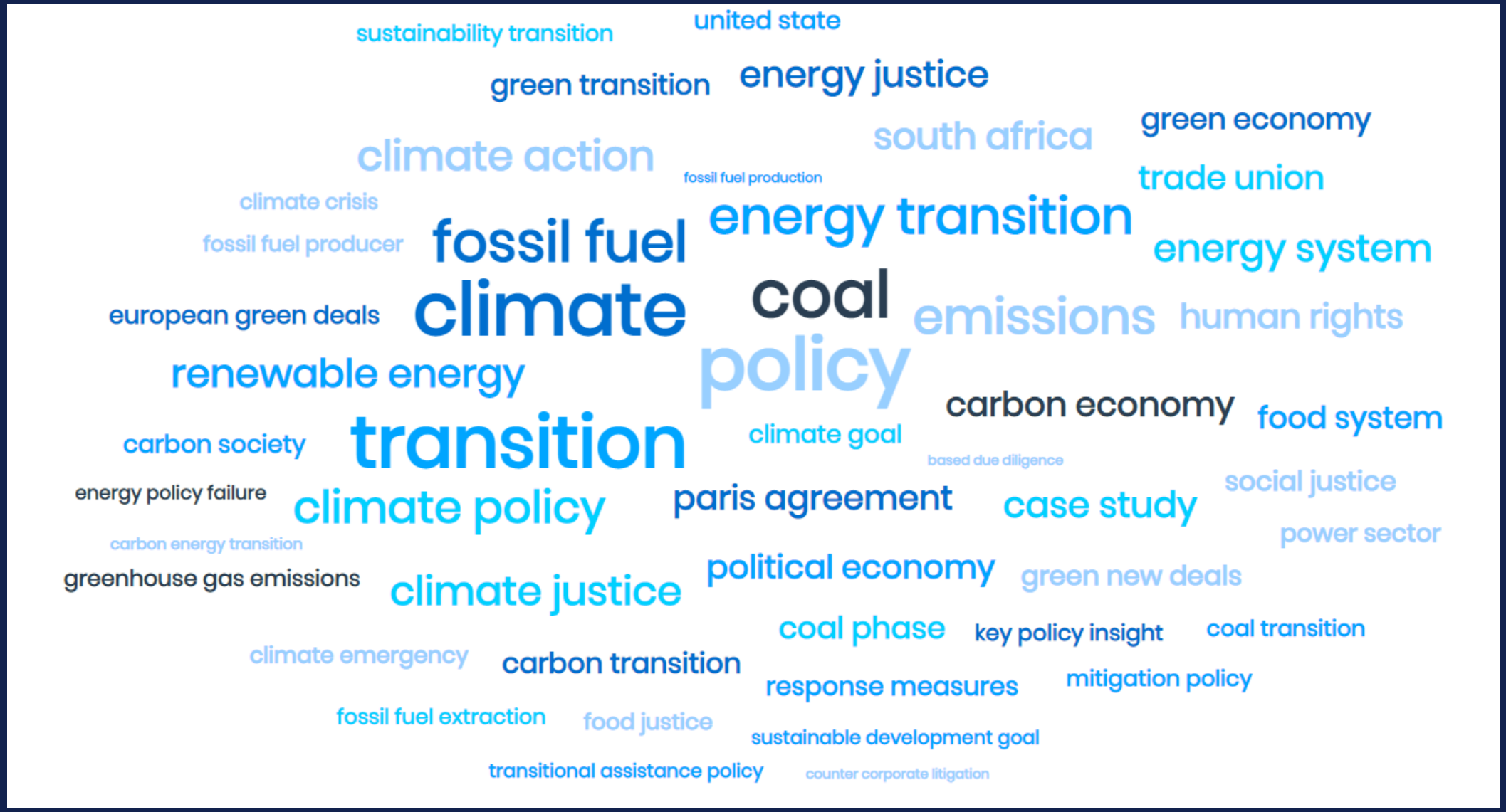
CIRED

Outline

1. Climate change mitigation, transition and transformations
2. JUST transition – a short history
3. JUST transition – conceptual frameworks
4. A typology of inequalities
5. Who is impacted by the transition, and how?
6. What can models tell us about how to achieve a just transition?

What words/phrases do you associate most with
a "just transition to net zero emissions societies"?

Go to www.menti.com and use the code 3163 4707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green transition
energy justice
green economy
south africa
climate action
trade union
fossil fuel production
climate crisis
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energy system
coal
european green deals
climate
emissions
human rights
policy
renewable energy
carbon economy
food system
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social justice
energy policy failure
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carbon energy transition
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climate justice
green new deals
coal phase
key policy insight
coal transition
climate emergency
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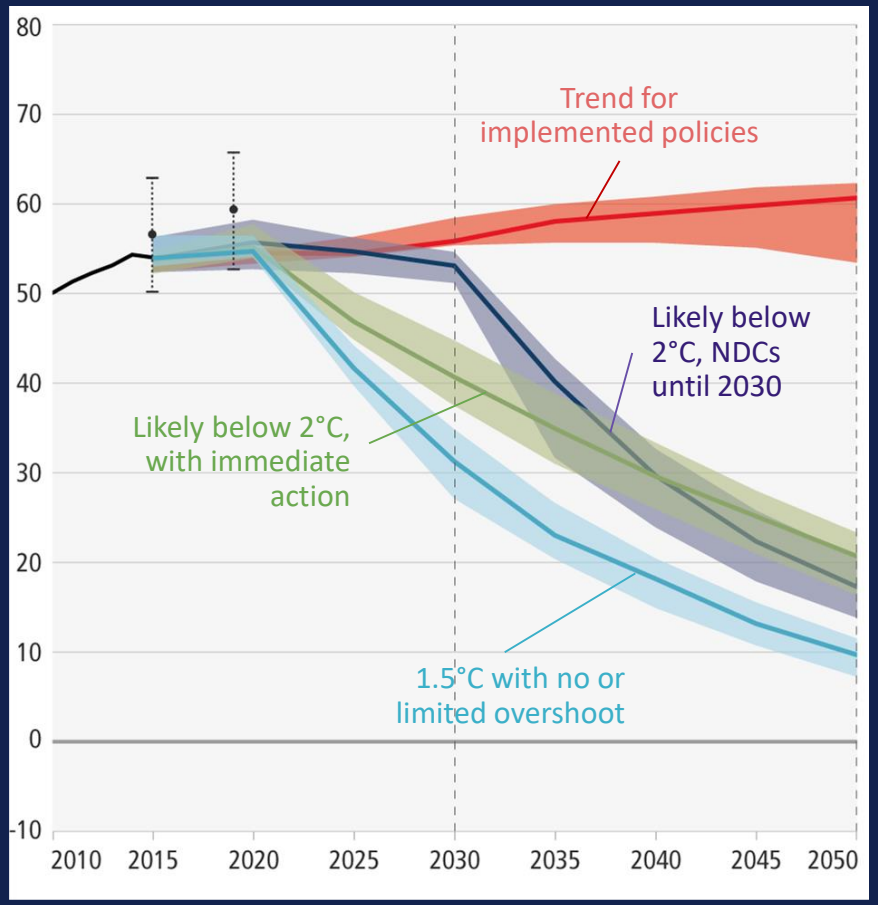
response measures
mitigation policy
fossil fuel extraction
food justice
sustainable development goal
transitional assistance policy
counter corporate litigation

Climate change mitigation

Rapid transitions, profound transformations required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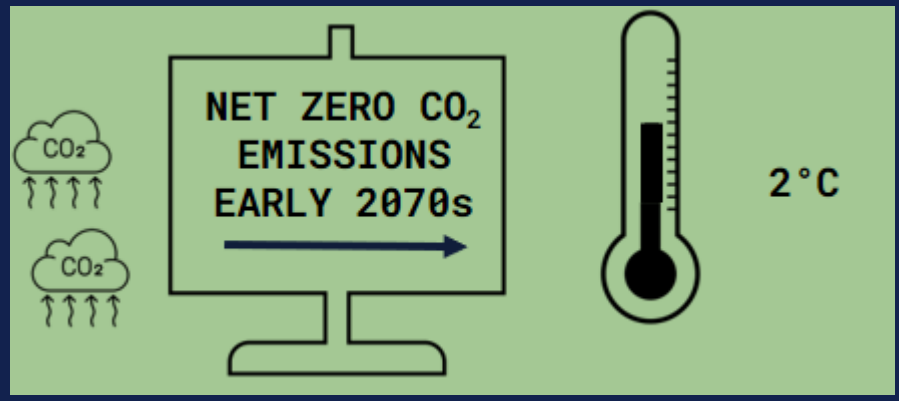
Trend for implemented policies
Likely below 2°C, NDCs until 2030
Likely below 2°C, with immediate action
1.5°C with no or limited overshoot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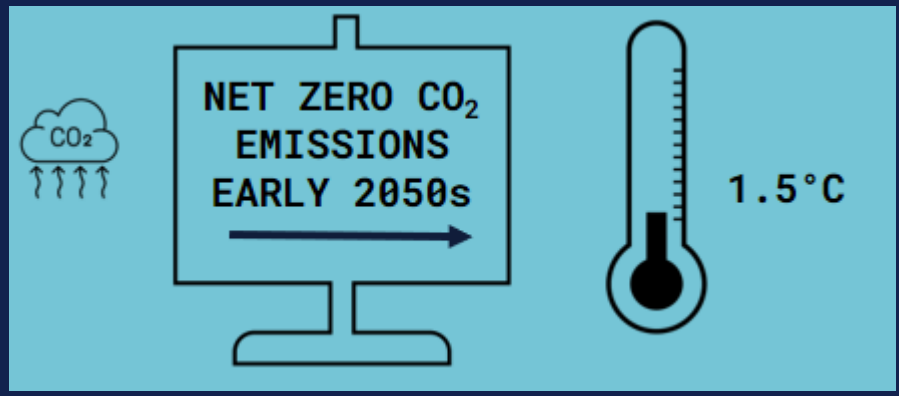
NET ZERO CO₂ EMISSIONS EARLY 2070s
2°C


CO₂
NET ZERO CO₂ EMISSIONS EARLY 2050s
1.5°C


Demand and services
Energy
Land use
Industry
Urban
Buildings
Transport

Just transition

Old wine in a new bottle?


IPCC reports
1990
FAR
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2022
AR6
UNFCCC
1992
Framework Convention
1997
Kyoto Protocol
2015
Paris Agreement


Number of occurrences
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just transition
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AR6
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Cross-AR6 | just transition | Search

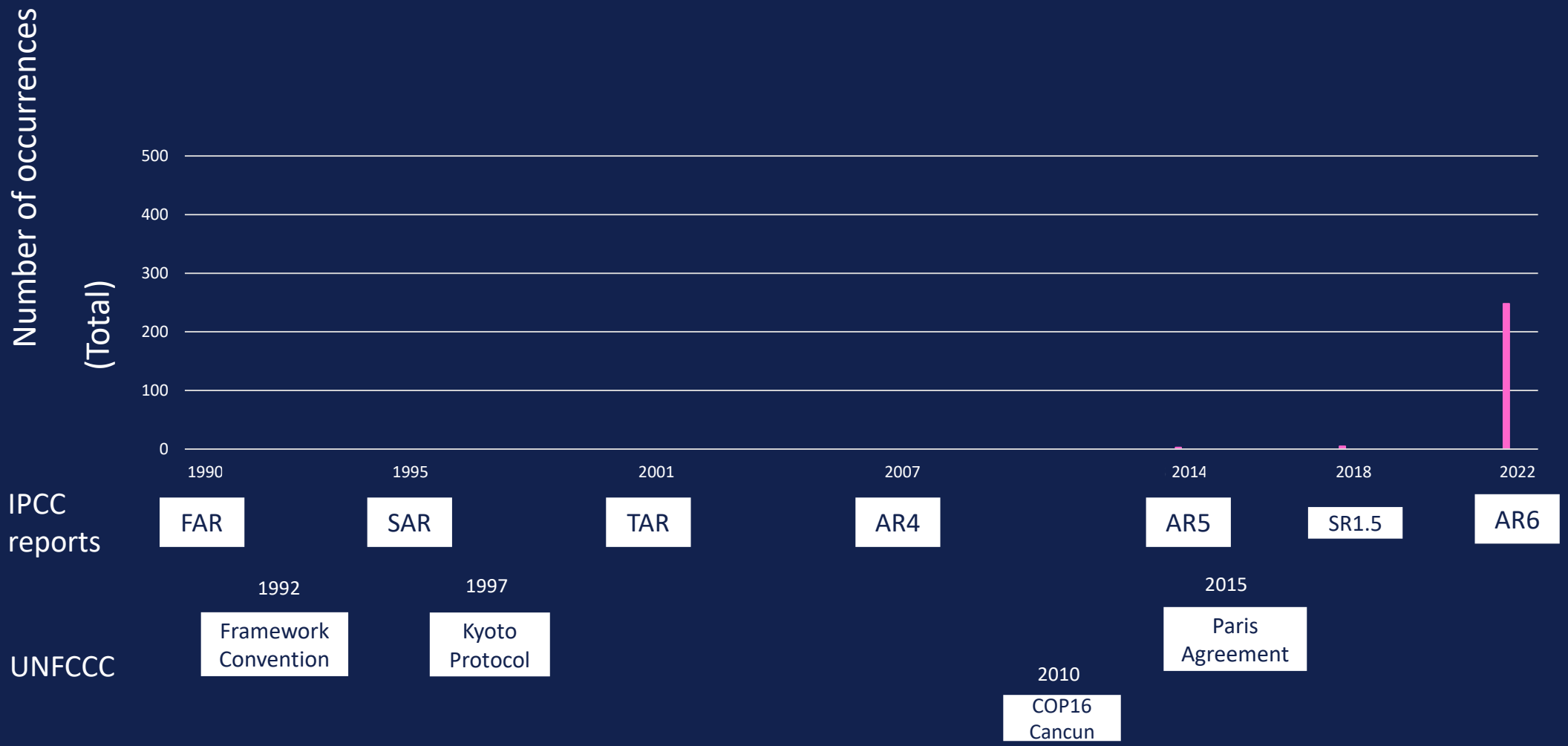
Just transitions [Cross-AR6]

A set of principles, processes and practices that aim to ensure that no people, workers, places, sectors, countries or regions are left behind in the transition from a high-carbon to a low-carbon economy. It stresses the need for targeted and proactive measures from governments, agencies, and authorities to ensure that any negative social, environmental or economic impacts of economy-wide transitions are minimized, whilst benefits are maximized for those disproportionally affected. Key principles of just transitions include: respect and dignity for vulnerable groups; fairness in energy access and use, social dialogue and democratic consultation with relevant stakeholders; the creation of decent jobs; social protection; and rights at work. Just transitions could include fairness in energy, land use and climate planning and decision-making processes; economic diversification based on low-carbon investments; realistic training/retraining programs that lead to decent work; gender specific policies that promote equitable outcomes; the fostering of international cooperation and coordinated multilateral actions; and the eradication of poverty. Lastly, just transitions may embody the redressing of past harms and perceived injustices. (ILO 2015; UNFCCC 2016)

Tags: wg3_ch4; wg3_ch17

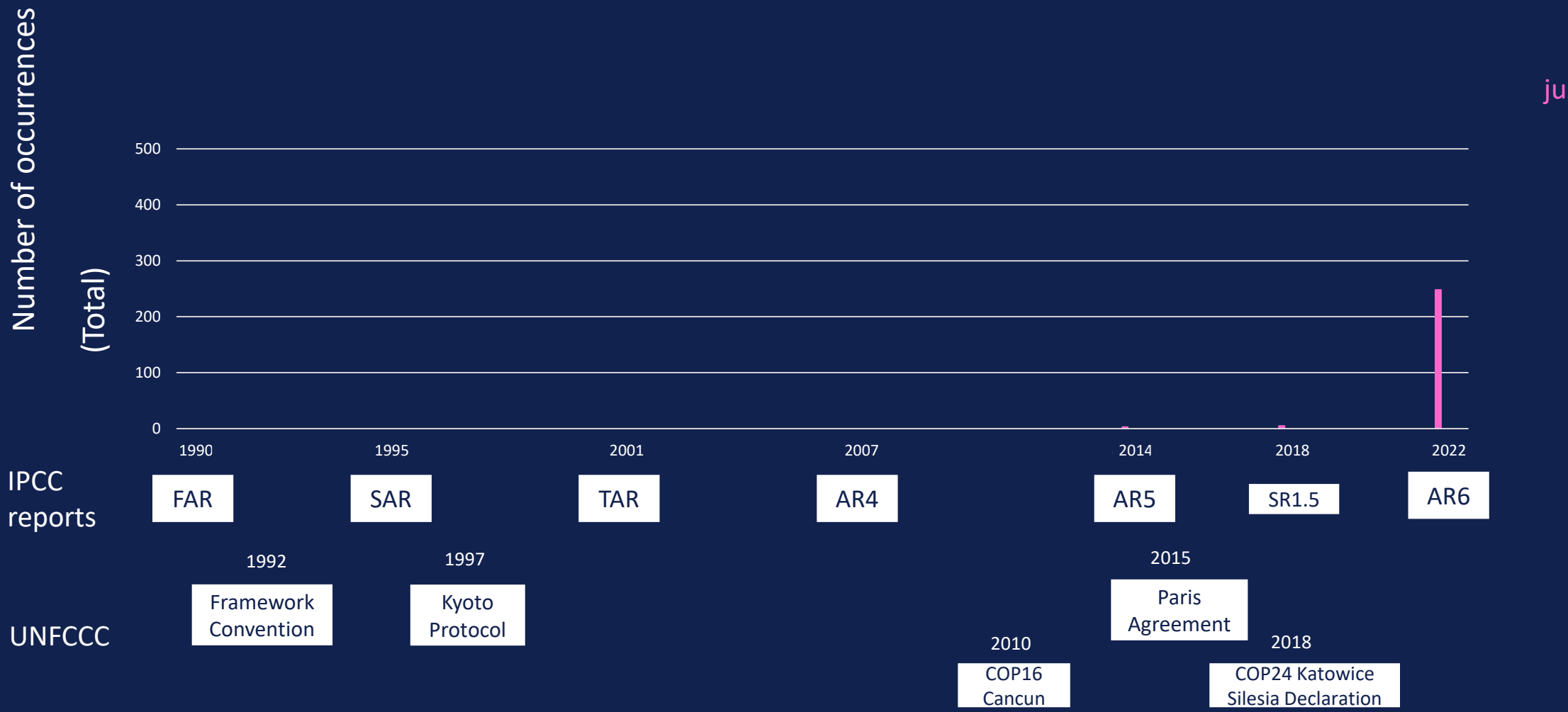
just transition

Taking into account the imperatives of **a just transition of the workforce** and the creation of decent work and quality jobs in accordance with nationally defined development priorities,



Realizes that addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while **ensuring a just transition of the workforce that creates decent work and quality jobs**;

Recognizing the importance of avoiding or minimizing negative impacts of response measures on social and economic sectors, **promoting a just transition of the workforce**, the creation of decent work and quality jobs in accordance with nationally defined development priorities and strategies, and contributing to building new capacity for both production and service-related jobs in all sectors, promoting economic growth and sustainable development,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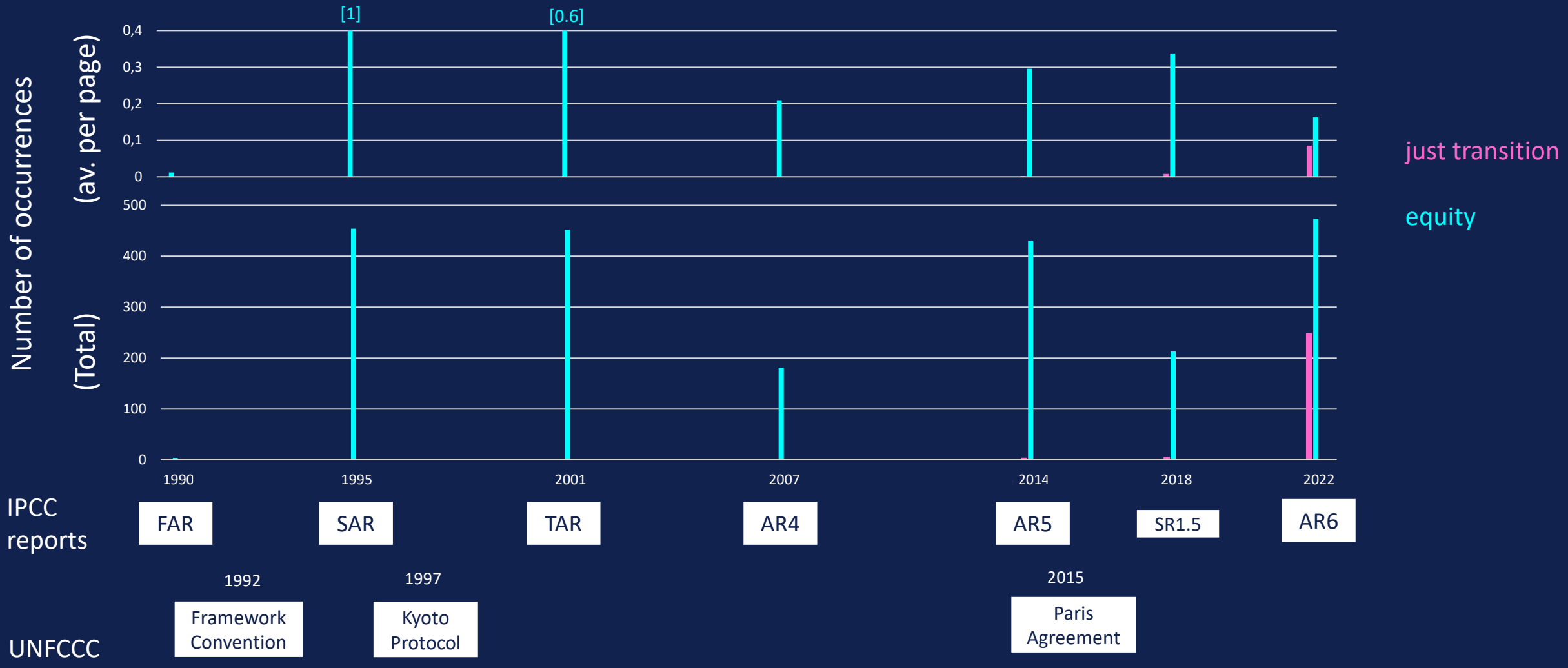
COP16 Cancun
2015
Paris Agreement
2018
COP24 Katowice Silesia Declaration
JUST TRANSITION
SOLIDARNA TRANSFORMACJA
COP24·KATOWICE 2018
Solidarity and Just Transition Silesia Declaration

just transition

The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of **equity** and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Equity [Cross-AR6] The principle of being fair and impartial, and a basis for understanding how the *impacts* and responses to *climate change*, including costs and benefits, are distributed in and by society in more or less equal ways. Often aligned with ideas of *equality*, *fairness* and *justice* and applied with respect to equity in the responsibility for, and distribution of, *climate* impacts and policies across society, generations, and gender, and in the sense of who participates and controls the processes of decision-making.



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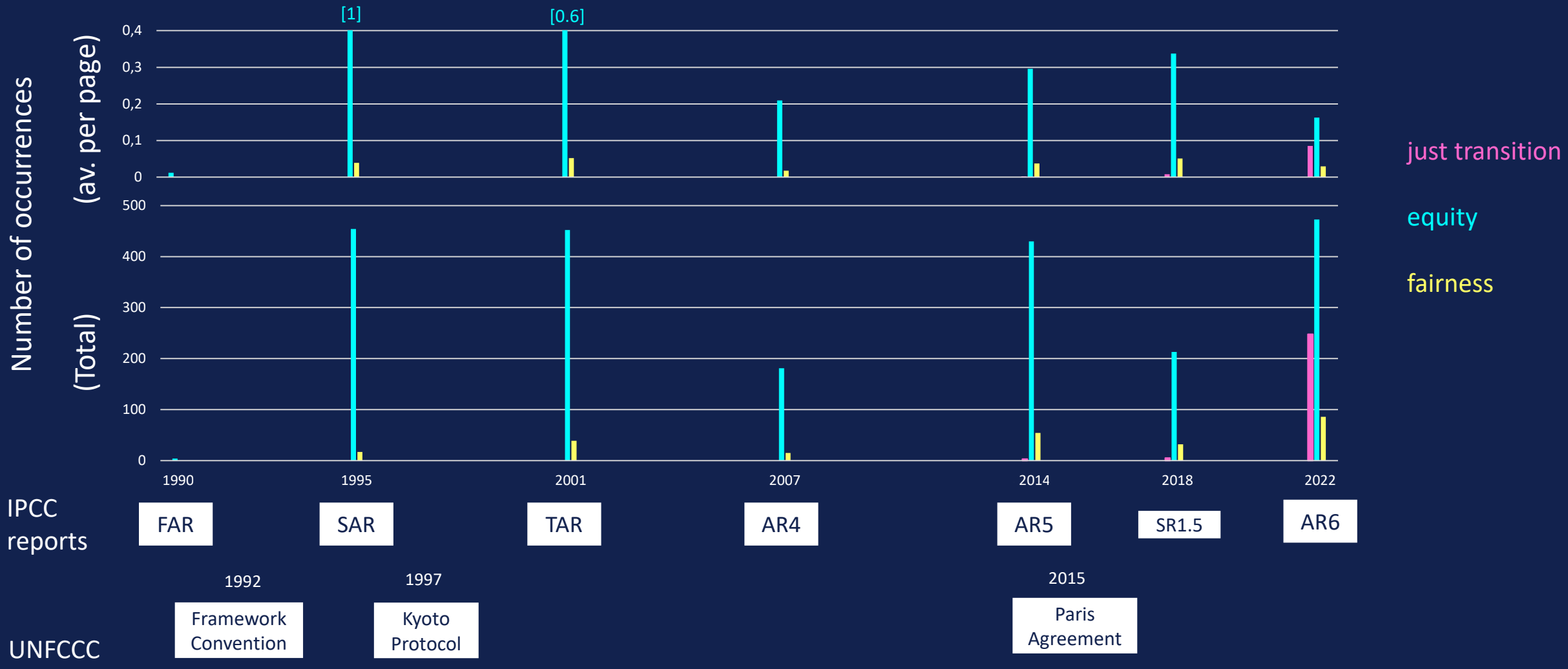
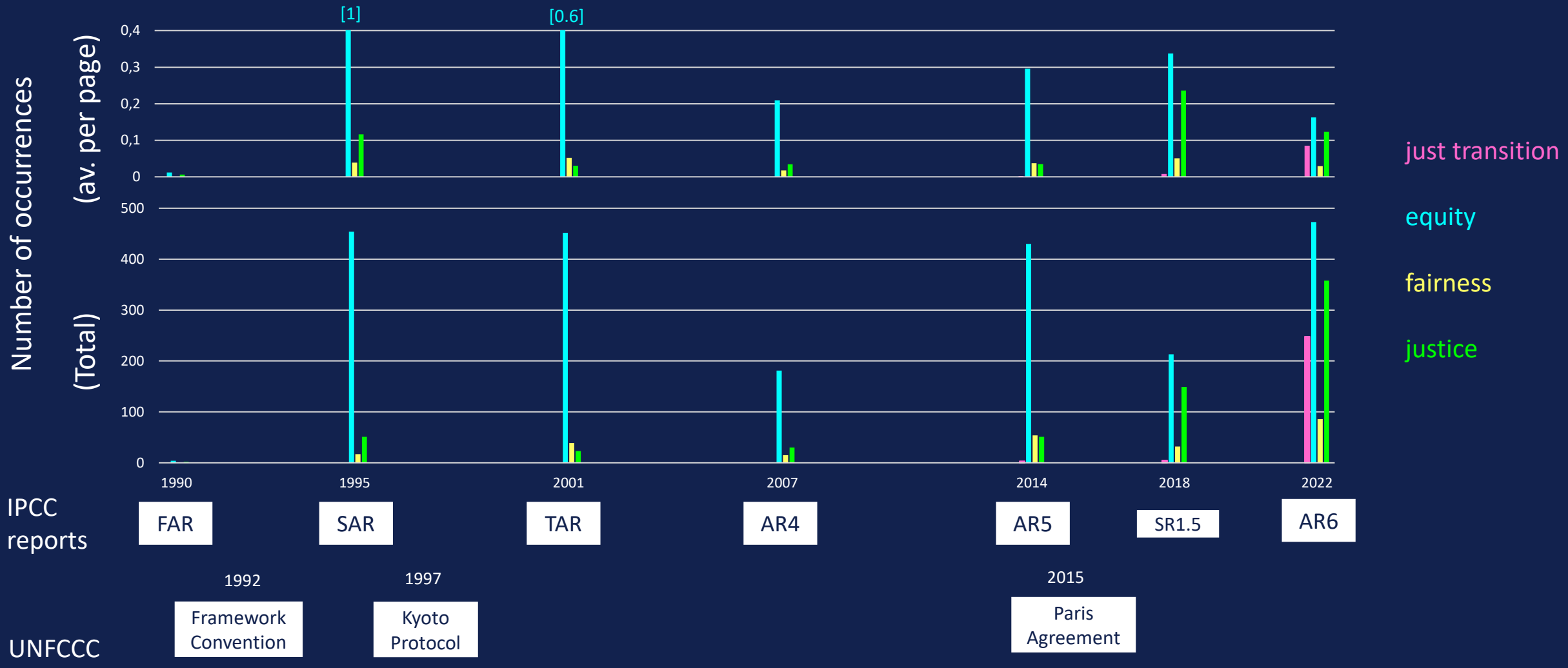
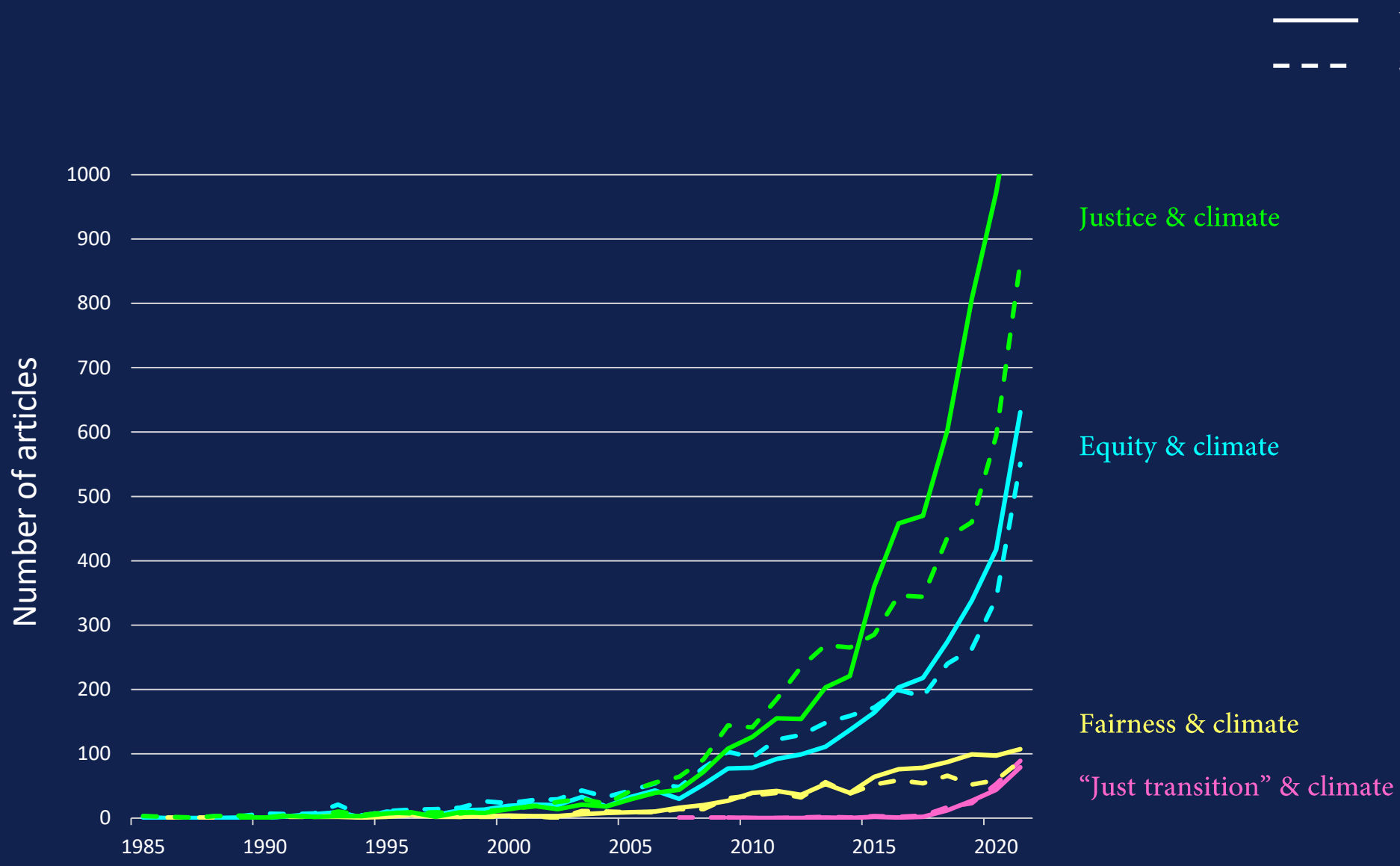


Fairness [Cross-AR6] Impartial and just treatment without favouritism or discrimination in which each person is considered of equal worth with equal opportunity.



Justice [Cross-AR6] Justice is concerned with setting out the moral or legal principles of fairness and equity in the way people are treated, often based on the ethics and values of society.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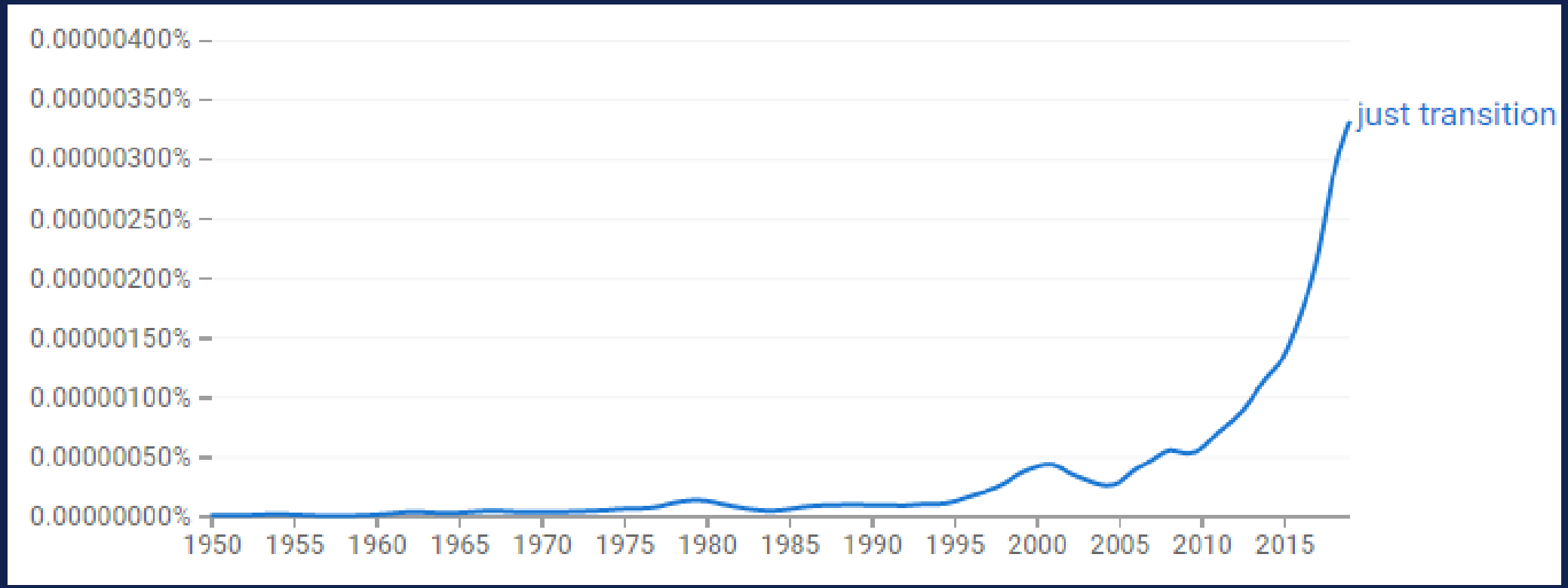
Justice & climate
Equity & climate
Fairness & climate
“Just transition” & climate

Web of Science – “just transition” & “climate”

Looking outside the climate bubble



from Ngram Viewer

JUST transition

Multiple dimensions and conceptual frameworks

Justice

Universal

Space

Time

Adapted from Heffron, 2021. What is the ‘Just Transition’?. https://doi.org/10.1007/978-3-030-89460-3_2.

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What type of justice ?

Distributive

Distributive justice

Justice in the allocation of economic and non-economic costs and benefits across society.

Implicit philosophies and equity criteria influence what is judged to be a fair or just distribution of outcomes.

Criteria	Descriptions
Utility	Just actions are judged to be those that produce increases in aggregate goods and that improve overall human well-being. Distribution is not considered.
Equality	All parties are deemed to be the same, and assumed to have equal opportunity, and thus should be treated in exactly the same way.
Proportional	Assumes that future losses and gains should be proportional, but not equivalent, in value based on current claims and allocations.
Needs	Preferential treatment should be given to the poorest, most vulnerable, and most in need.
Merit	Different parties ought to receive what they deserve—both reaping benefits and suffering costs—based on effort (e.g., work) and inputs (e.g., capacity, investments). Also referred to as just desserts.
Rights	Treatment of different groups should ensure that minimum thresholds of basic human rights are respected and depends on pre-existing rights (e.g., Indigenous people rights, historical tenure).

Adapted from Bennett et al., 2019. Just Transformations to Sustainability. https://doi.org/10.3390/su11143881.

What type of justice ?

Distributive

Distributive justice

Justice in the allocation of economic and non-economic costs and benefits across society.

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What type of justice ?

Distributive

Procedural

Distributive justice

Justice in the allocation of economic and non-economic costs and benefits across society.

Procedural justice

Justice in the way outcomes are brought about including who participates and is heard in the processes of decision-making.

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What type of justice ?

Distributive

Procedural

Restorative

Distributive justice

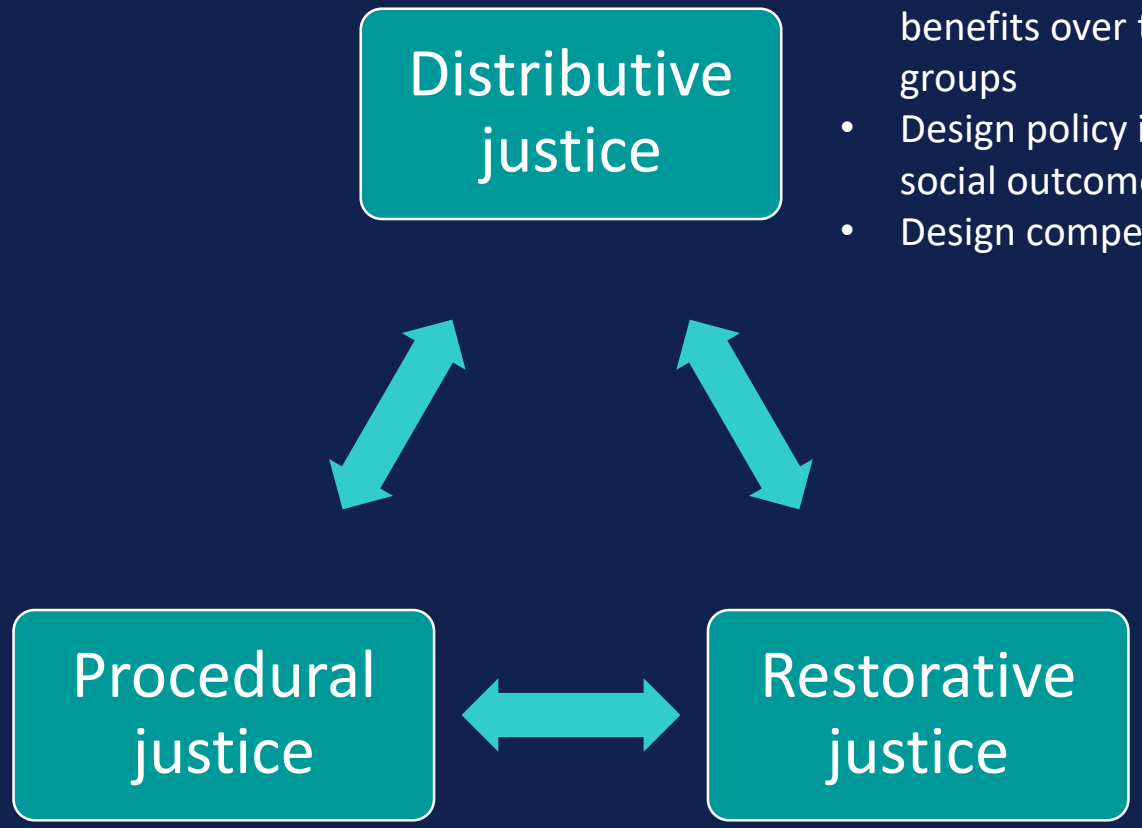
Justice in the allocation of economic and non-economic costs and benefits across society.

Procedural justice

Justice in the way outcomes are brought about including who participates and is heard in the processes of decision-making.

Restorative justice

Justice that encompasses the redressing of past harms and perceived injustices.



- Consider distribution of costs and benefits over time, space and between groups
- Design policy instruments to improve social outcomes
- Design compensation mechanisms

- Facilitate inclusive, participatory, transparent and accountable planning and management
- Ensure institutions, policies and management perceived legitimacy
- Support capacity for participation
- Ensure stakeholders have access to decisions

- Identify rights holders
- Acknowledge pre-existing rights and tenure
- Acknowledge and redress past-harms

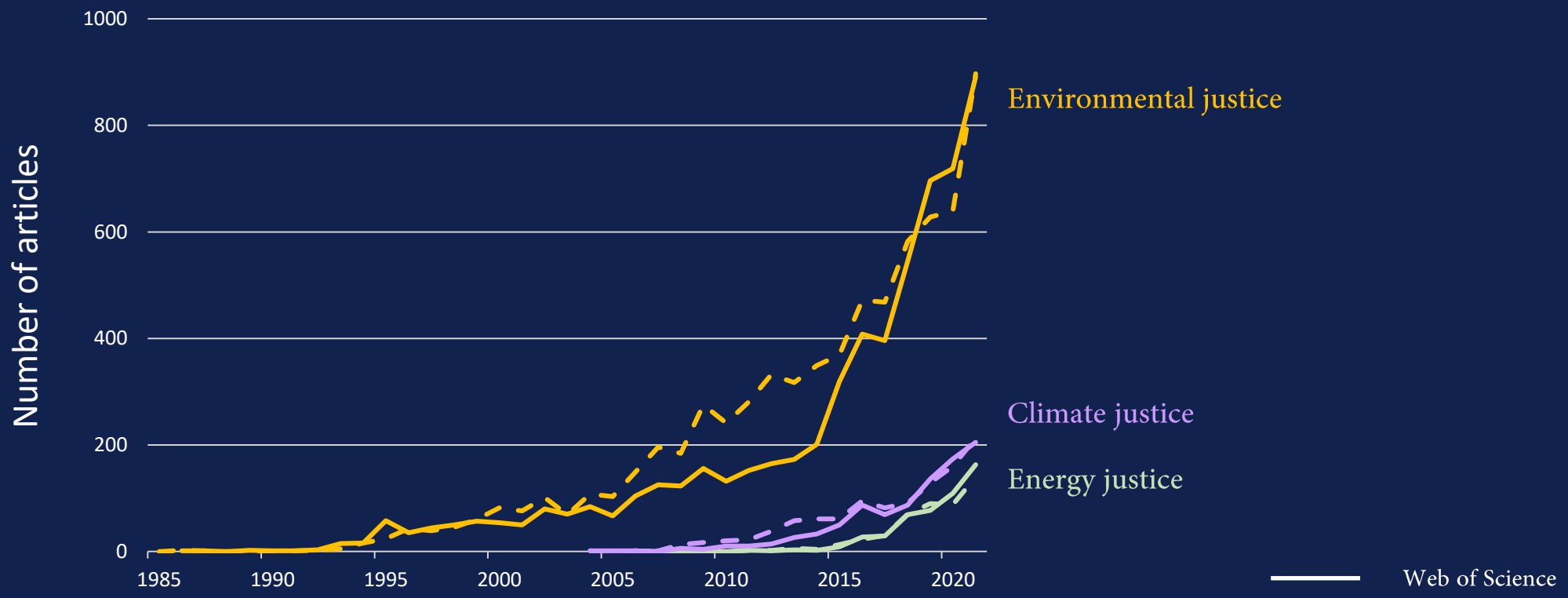
Adapted from Bennett et al 2019. Just Transformations to Sustainability. https://doi.org/10.3390/su11143881.

What type of justice ?

Environmental

Energy

Climate



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What form of universality ?

Two universal forms of justice

- Cosmopolitanism
- Recognition

What form of universality ?

Two universal forms of justice

- Cosmopolitanism
- Recognition

Also, who is concerned?

- Those whose livelihoods are affected and dependent on fossil fuels or high-emission activities
- Those currently without access to reliable energy supplies and living in energy poverty

Who is concerned ?

Disproportionate burden of the transition

- Job losses, revenue losses (for individuals, for communities/territories)
- Loss of identity
- Higher cost of energy, exacerbated energy poverty, delayed access to energy (services)

Lack of access to energy transition opportunities

- Access to benefits of the transition, jobs, technologies (and benefits from support policies)
- Possibility to get involved in decisions and leadership

Adapted from Carley and Konisky, 2020. The justice and equity implications of the clean energy transition. https://doi.org/10.1038/s41560-020-0641-6.

What scale (/scope) is considered ?

Local, national and international scales

Location and geographical scope

How is time considered ?

Time horizon, transition timelines and speed of changes

Intergenerational equity

Forward-looking vs. backward-looking

Just transition and the Sustainable Development Goals

Just transition and the Sustainable Development Goals

Just transition and the Sustainable Development Goals

Just transition and the Sustainable Development Goals

Just transition and the Sustainable Development Goals

Just transition and the Sustainable Development Goals

Just transition as

- a labor-oriented concept
- an integrated framework for justice
- a theory of socio-technical transition
- a governance strategy
- public perception

Adapted from Wang and Lo, 2021. Just Transition: A conceptual review.
https://doi.org/10.1016/j.erss.2021.102291.

A typology of inequalities

A typology of inequalities

Burdens and benefits

- Climate change impacts and mitigation give rise to an uneven distribution of burdens and benefits
- Burdens: direct impacts of climate change, job and revenue losses, fuel poverty
- Benefits: new employment opportunities in low-carbon sectors, access to advanced low-carbon and efficient technologies
- Let’s first quickly review the different types of inequalities at stake

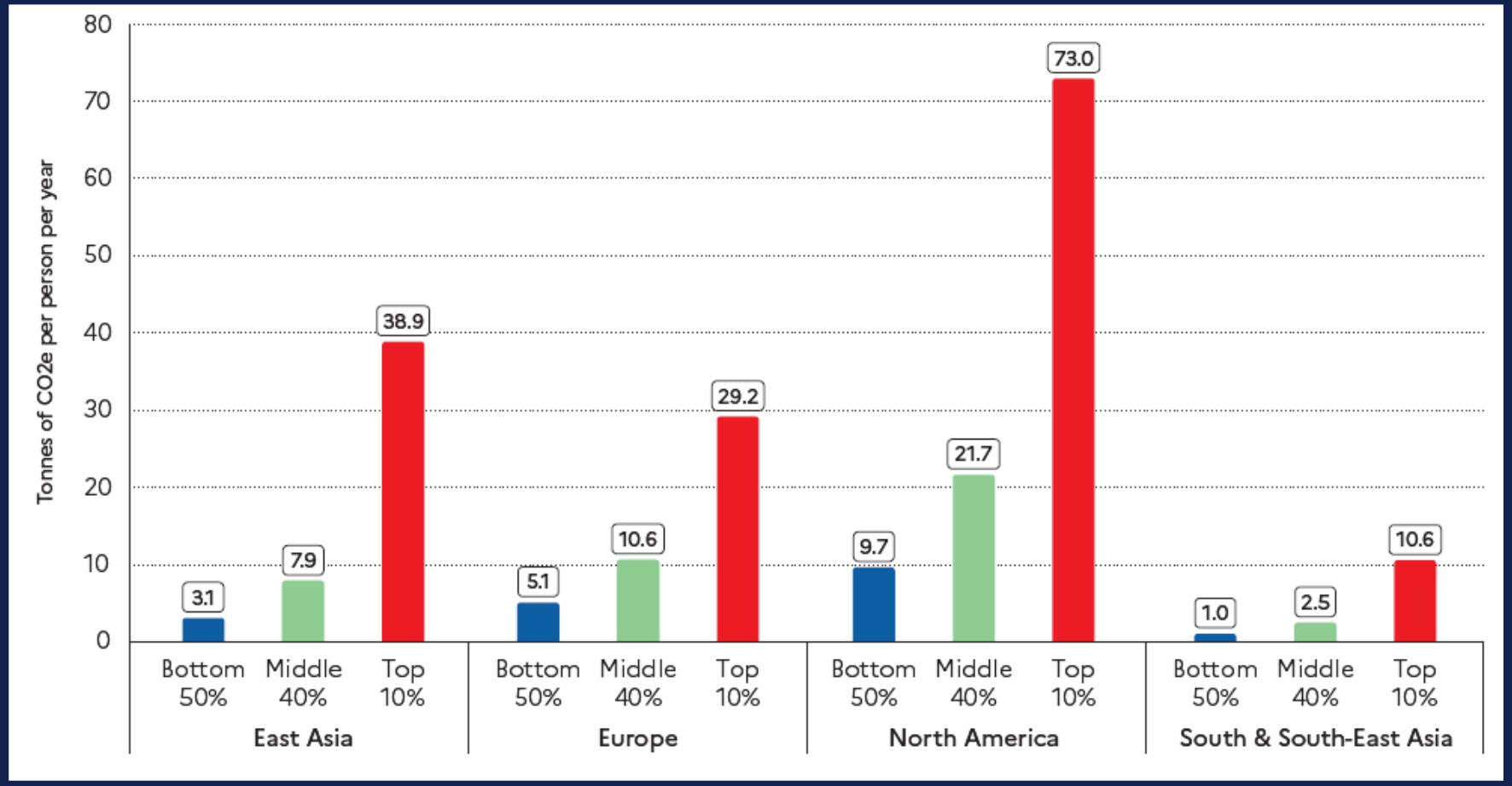
A typology of inequalities in relation to climate change and the just transition

Ecological inequalities: who emits?

Environmental inequalities: who suffers?

Policy-induced inequalities: who pays?

Ecological impact inequalities: who emits more?



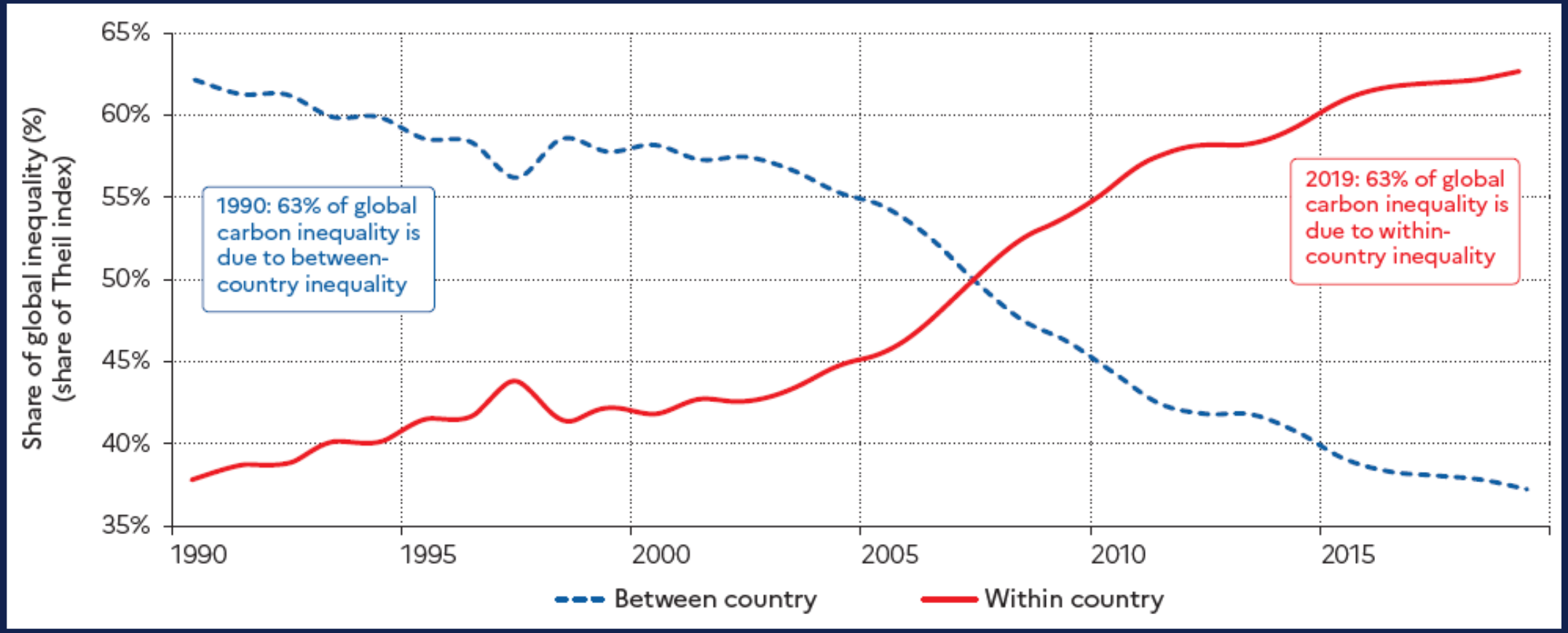
Emission inequalities are not just a rich vs. poor country issue

There are high emitters in low- and middle-income countries and low emitters in high-income countries

Adapted from (Chancel et al., 2022): World Inequality Report 2022

wir2022.wid.wo

Global carbon inequalities are mainly due to inequality within countries

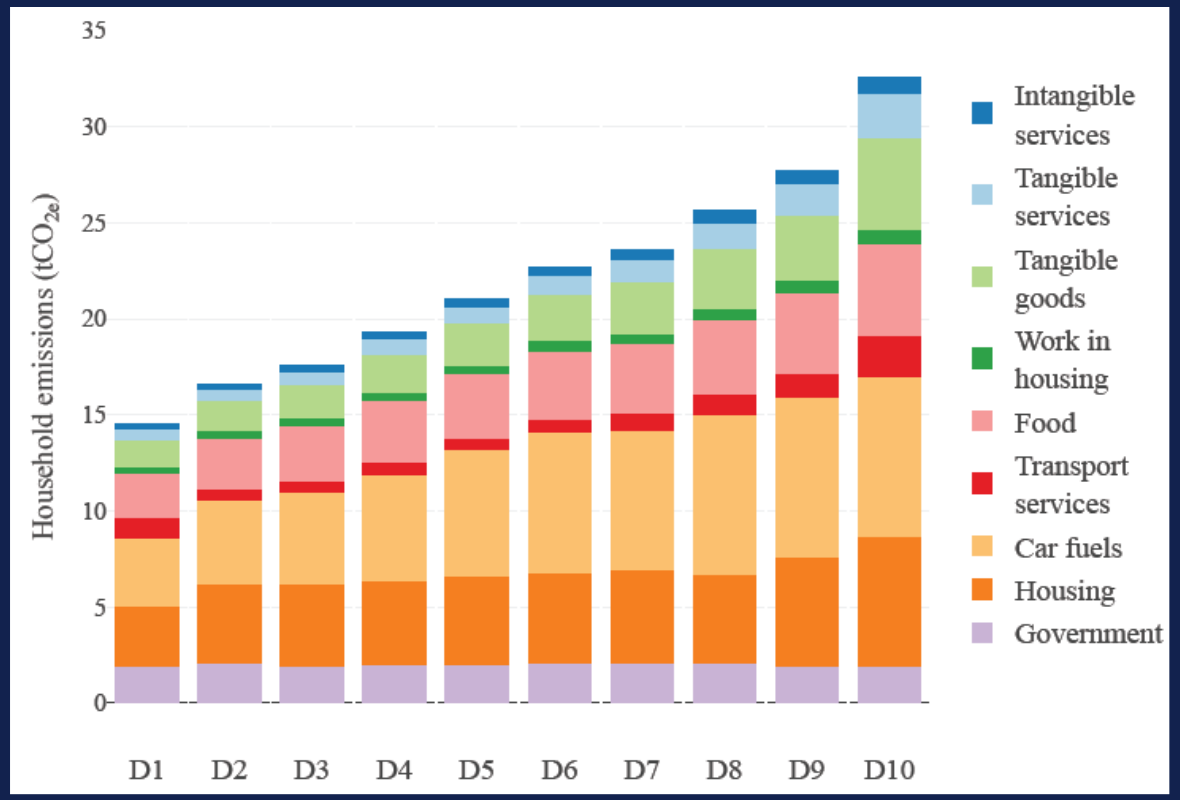


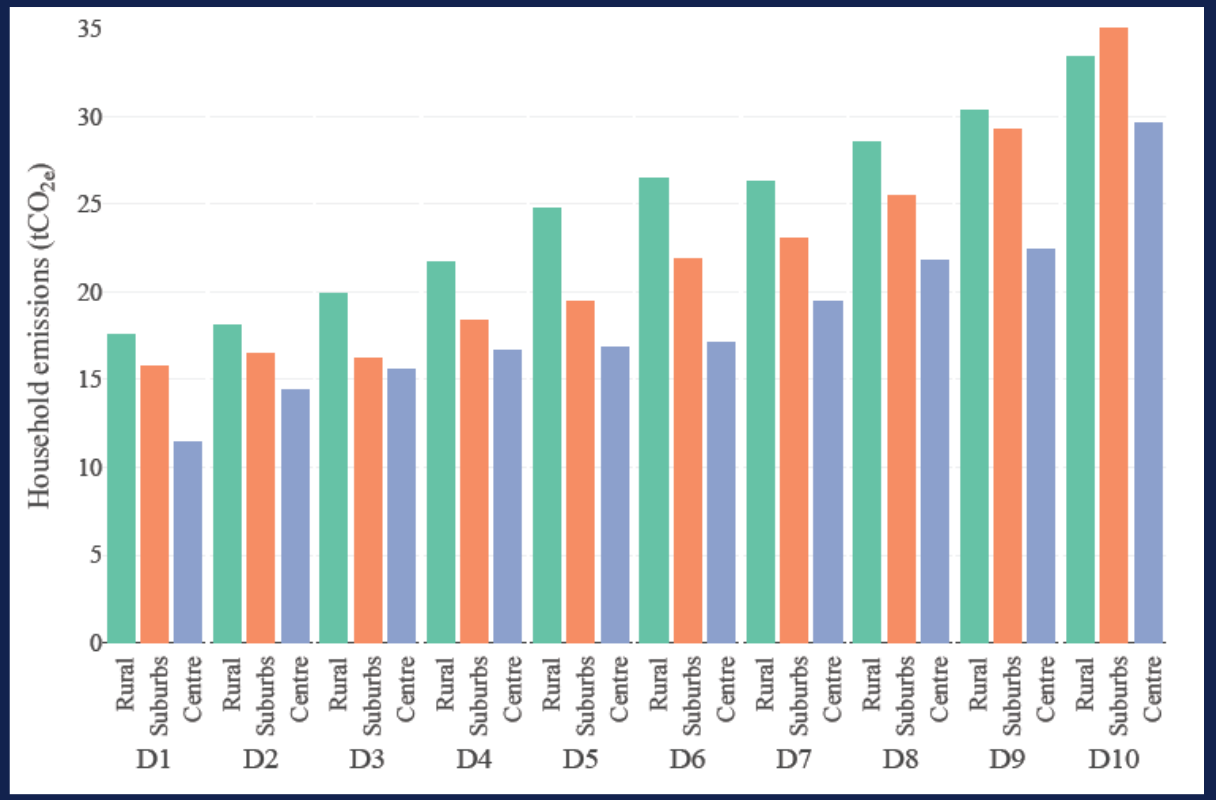
In 2019, 37% of global carbon inequality between individuals was due to differences in emissions levels between countries, while 63% was explained by inequality within countries

Adapted from (Chancel et al., 2022): World Inequality Report 2022

wir2022.wid.wo

Ecological inequalities do not simply mirror income inequalities





Household emissions increase with income, but also show high variability due to geographical, socio-demographic and technical factors which locks households in a dependence on fossil fuels, at least in the short term (commuting, heating system)

Such analyses are crucial to identify potential winners and losers of carbon tax reforms and design policies that are politically acceptable

Adapted from (Pottier et al., 2021): Who emits CO2 ? Landscape of ecological inequalities in France from a critical perspective

http://dx.doi.org/10.2139/ssrn.3853896

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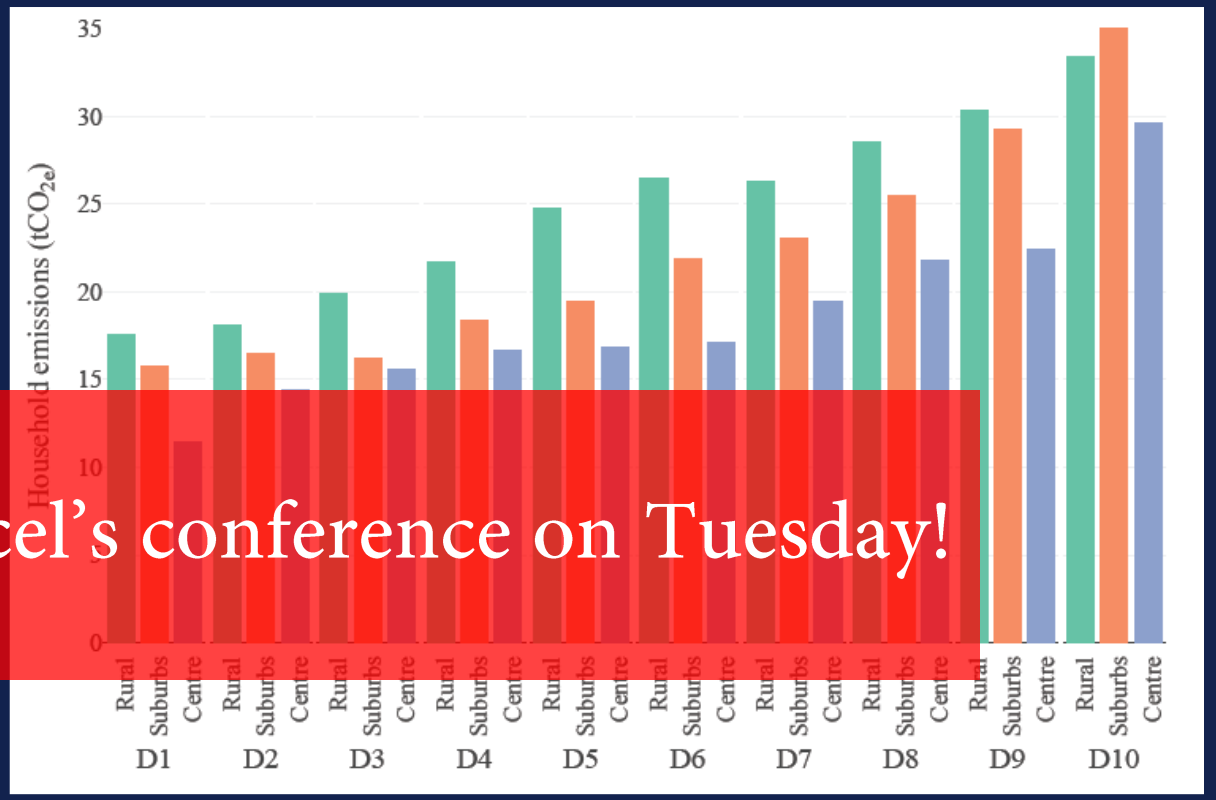

Stay tuned for Lucas Chancel's conference on Tuesday!

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Environmental inequalities: who suffers?

Environmental inequalities: inequalities regarding the exposure to pollutants, nuisances and environmental risks, and the access to environmental amenities and resources (Emelianoff, 2006)

- Impacts from energy facilities and infrastructure

Examples: pollution from coal ash pond spills, air pollution from highways, noise from wind turbines

Negative externalities are borne disproportionately by those who reside nearby, usually poor neighbourhoods

People with low-income already experience more of the negative externalities of energy facilities, infrastructure, see (Banzhaf et al., 2019) for the case of the U.S.

- Impacts from climate change

Five channels through which climate change may exacerbate inequalities

Common shocks that drive or keep people in poverty will be worsened by climate change

Agricultural revenues: Impact depends on the fraction of the population working in agriculture, productivity, income diversification within households. Main sectoral driver explaining higher poverty due to climate change in World Bank scenarios

Labour productivity: 1˚C warming could reduce labour productivity by 1–3% for people working outdoors or without AC (Park et al. 2015), (Deryugina and Hsiang, 2014), (Heal and Park, 2013)

Food prices: Impact on poverty depends on the fraction household's budget dedicated to food. In all regions this fraction is decreasing with household income

Disasters: droughts, floods, storms, … In most countries, poor households are more exposed to floods than the average

Health: Climate change increases mortality, notably due to increased heat stress, diarrhoeal disease, malaria, dengue and undernutrition

Adapted from (Hallegatte & Rozenberg, 2017): Climate change through a poverty lens

https://.doi.org/10.1038/nclimate3253

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Stay tuned for Julie Rozenberg's lecture on Tuesday!

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Policy-induced inequalities: who pays?

…. This is the crux of the matter for the question of the just transition, and what the rest of this introduction lecture will focus on

Who is impacted by the transition, and how?

Who is likely to be adversely affected by the low-carbon transition?

Is the ecological transition at risk of reproducing socially unequal and geographically uneven patterns? (Avila, 2018)

- STATES: "unburnable" fossil fuel resources (e.g., Middle-East, Former Soviet Union) (McGlade & Ekins, 2015). Stranded assets and profit losses put a burden on public finances (directly if State-owned, indirectly through tax revenue loss and unemployment benefits if not)
- CORPORATIONS: energy and carbon intensive businesses will be affected through asset write-downs, lower profits, reduced stock value, bankruptcy
- WORKERS: job losses in energy and carbon-intensive industries, and their suppliers. These may not be compensated by job creations in all regions (depending on structural change) (ILO, 2018)
- COMMUNITIES: multiplier effect of industrial closures and associated job losses in communities where fossil fuel industries generate a significant share of the region's economic activity. Low-carbon technology deployment may also adversely impact communities
- CONSUMERS: higher energy price through the removal of fossil fuel subsidies and carbon pricing may disproportionately affect poor consumers

Adapted from (Green & Gambhir, 2019): Transitional assistance policies for just, equitable and smooth low-carbon transitions: who, what and how?

https://doi.org/10.1080/14693062.2019.1657379

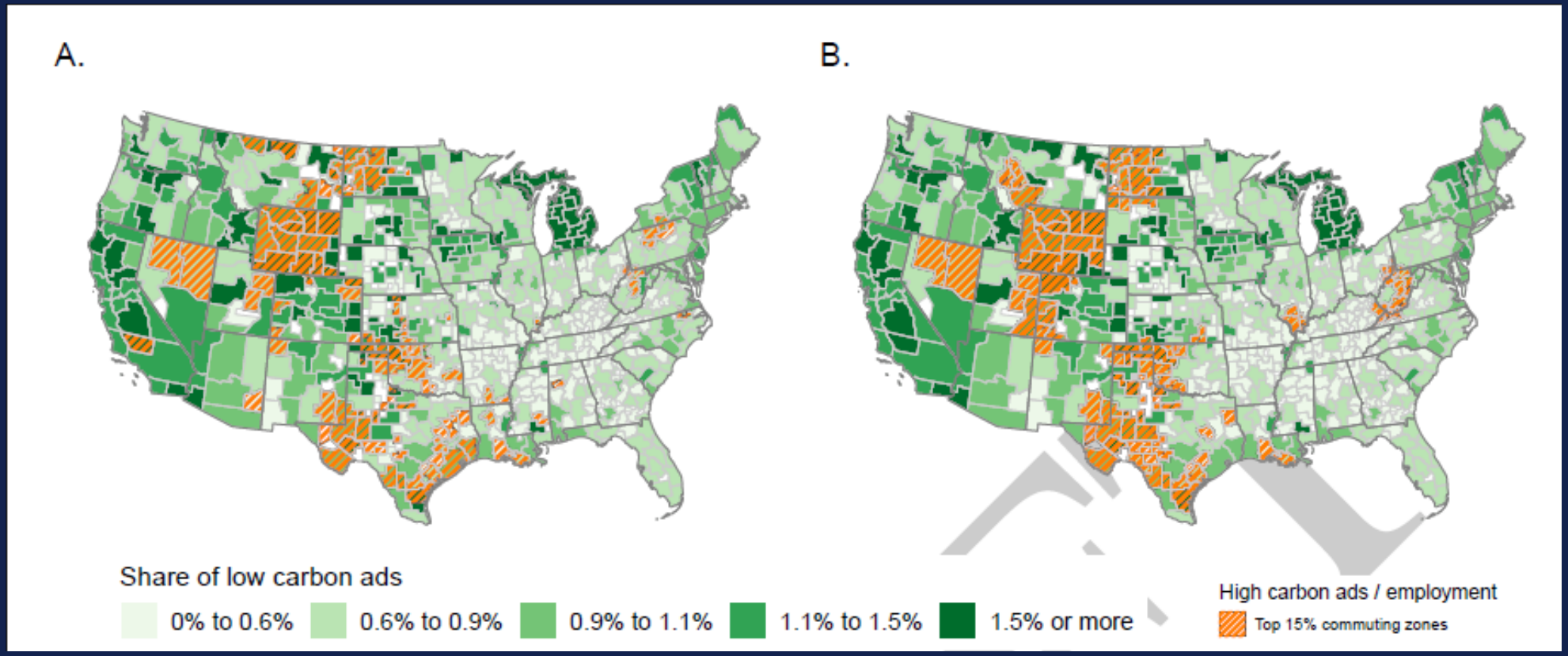
How does the energy transition affect workers, States, communities, and consumers? Some examples

- Employment
- Fiscal vulnerability
- Energy technology access
- Energy poverty

Labour market impacts of low-carbon transitions

- Job loss has been the main argument against coal exit
- Counter argument: clean energy industry provides significant job creation (ILO, 2018), e.g., RE deployment may create more jobs per unit of installed capacity than conventional power production (Cameron & van der Zwaan, 2015)
- What matters is less the absolute number of job losses than the concentration of job losses and the quality of jobs that people find afterwards (Haywood et al., 2021)
- Skill and wage gaps: high carbon (coal) jobs are highly unionised, low-skilled, high wage, very secure
- Low-carbon job ads have higher skill requirements in general than high-carbon job ads (Saussay et al., under review)
- Difficult for low-skilled workers to find jobs with the same wage premium for their existing skills (Jolley et al., 2019)
- Indirect effect: with coal mining or power plant operation closures, surrounding communities may experience a significant loss of other employment (retail, commercial), due to reduced demand for other local services and commodities (Carley & Konisky, 2020) quoting examples from the U.S. (Carley et al., 2018) and Australia (Burke et al., 2019)

Limited overlap between locations of low-carbon job creation and locations where high-carbon jobs are destroyed



Spatial distribution of low-carbon and high carbon vacancies (A) and jobs (B) in low skilled occupations

High-carbon jobs very concentrated, low-carbon job ads are more spread across space. High carbon jobs cluster in poorer regions, low-carbon vacancies in wealthier areas

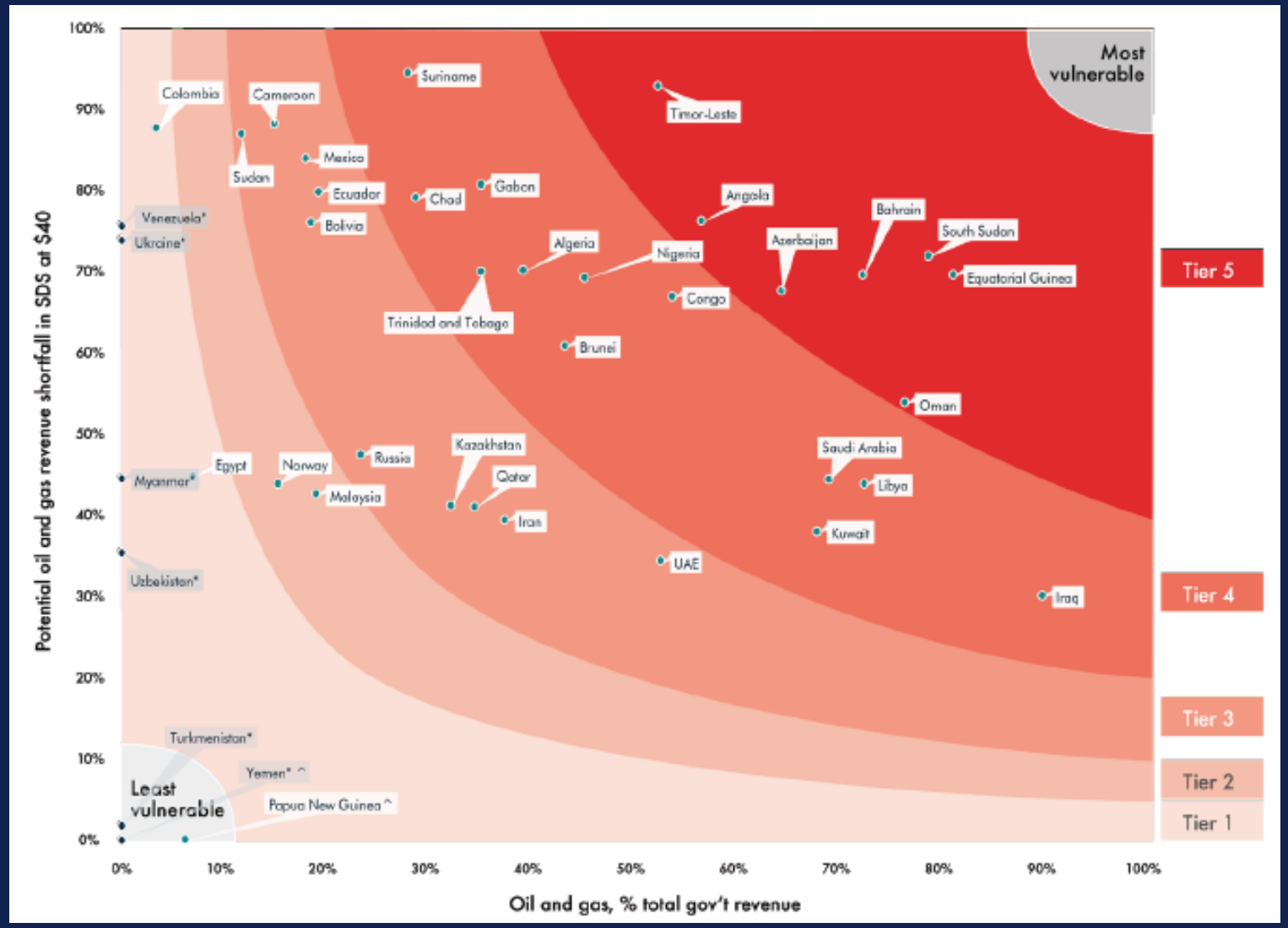
Spatial mismatch implies high reallocation costs. This has not been modelled in existing studies

Adapted from (Saussay et al., under review): Who's fit for the low-carbon transition? Emerging skills and wage gaps in job ad data

Fiscal vulnerability: what impact on fossil fuel dependent national and local economies?

- Fossil fuels are an important source of public revenue (through royalties) and connected to societal goals
- At the country level: safety nets are funded by fossil fuel tax revenues.
- At the sub-national level: the spatial concentration of fossil fuel activities amplifies the negative effects of climate policies on fossil fuel communities through negative multiplier effects (Saussay et al., under review), risk of fiscal collapse in coal reliant communities (Morris et al., 2019)
- Inability to raise revenue, repay debt, or provide basic public services may ensue

Fiscal vulnerability of Petrostates in the energy transition



Combines fiscal dependence on oil and gas revenues and potential oil and gas revenue shortfall in a low-carbon scenario

Vulnerability = potential government revenue shortfall [multiplication of axes] 2021-2040

Tiers definition: shortfall of <5% (1), <10% (2), <20% (3), <40% (4), >40% (5)

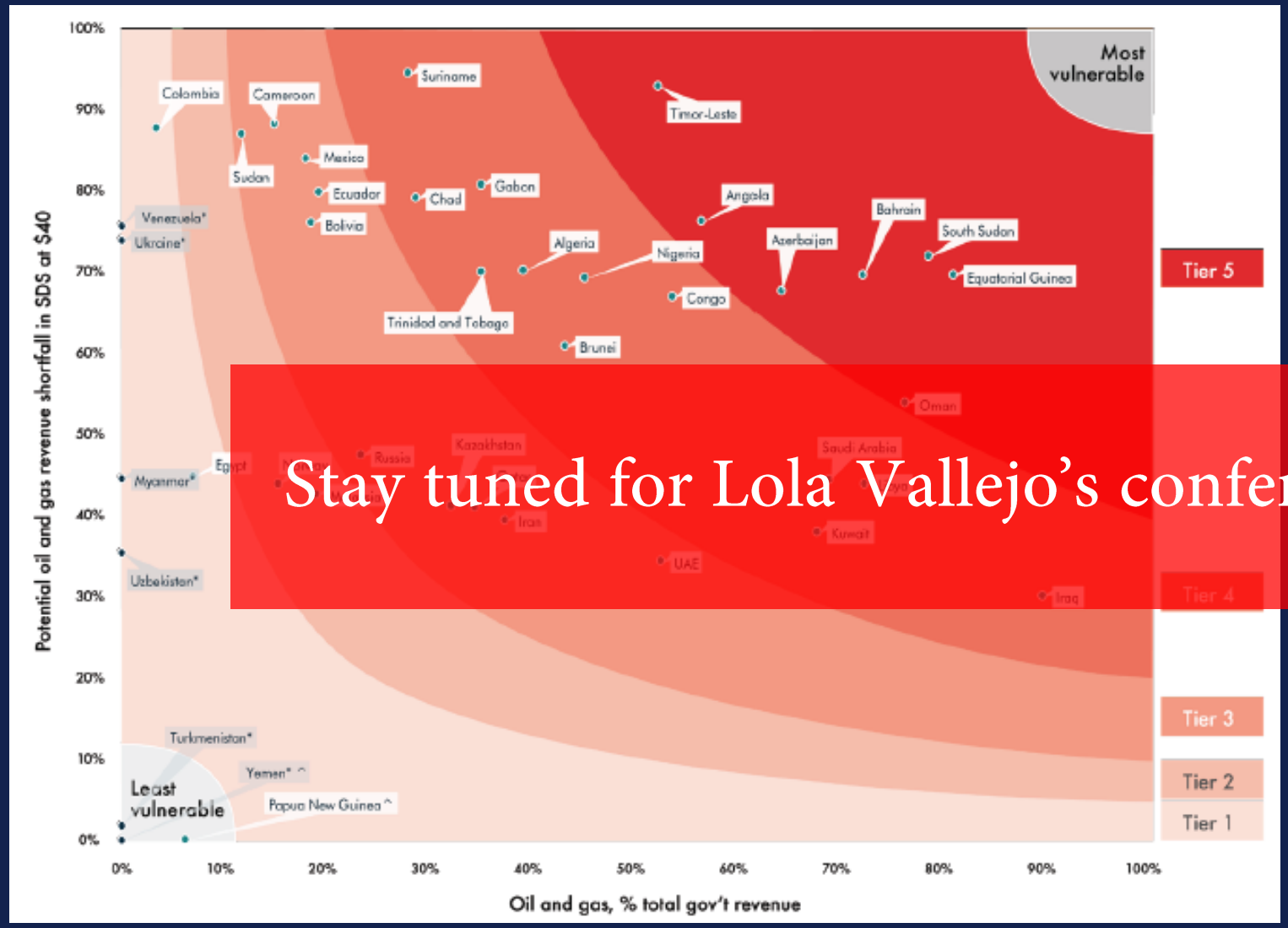
Half are in top 2 highest vulnerability tiers (shortfall >20%)

For some countries in tier 5, potential shortfalls account for over half of total government revenue

Adapted from (Carbon Tracker, 2021): Beyond Petrostates: The burning need to cut oil dependence in the energy transition

https://carbontracker.org/reports/petrostates-energy-transition-report/

Fiscal vulnerability of Petrostates in the energy transition



Stay tuned for Lola Vallejo's conference on Thursday!

Combines fiscal dependence on oil and gas revenues and potential oil and gas revenue shortfall in a low-carbon scenario

Vulnerability = potential government revenue shortfall [multiplication of axes] 2021-2040

Tiers definition: shortfall of <5% (1), <10% (2), <20% (3), <40% (4), >40% (5)

Half are in top 2 highest vulnerability tiers (shortfall >20%)

For some countries in tier 5, potential shortfalls account for over half of total government revenue

Adapted from (Carbon Tracker, 2021): Beyond Petrostates: The burning need to cut oil dependence in the energy transition

https://carbontracker.org/reports/petrostates-energy-transition-report/

Access to low-carbon technologies is mostly seized by high-income households

- **Electric vehicles**

Tackling transport pollution primarily through a shift to low-emission vehicles favours those who already have access to private vehicles and can afford to use it

- Possible pressure to raise fuel taxes for fossil fuel vehicles as they become a minority used by low-income groups
- Does not address mobility injustices linked to difficulties in moving around without access to a car

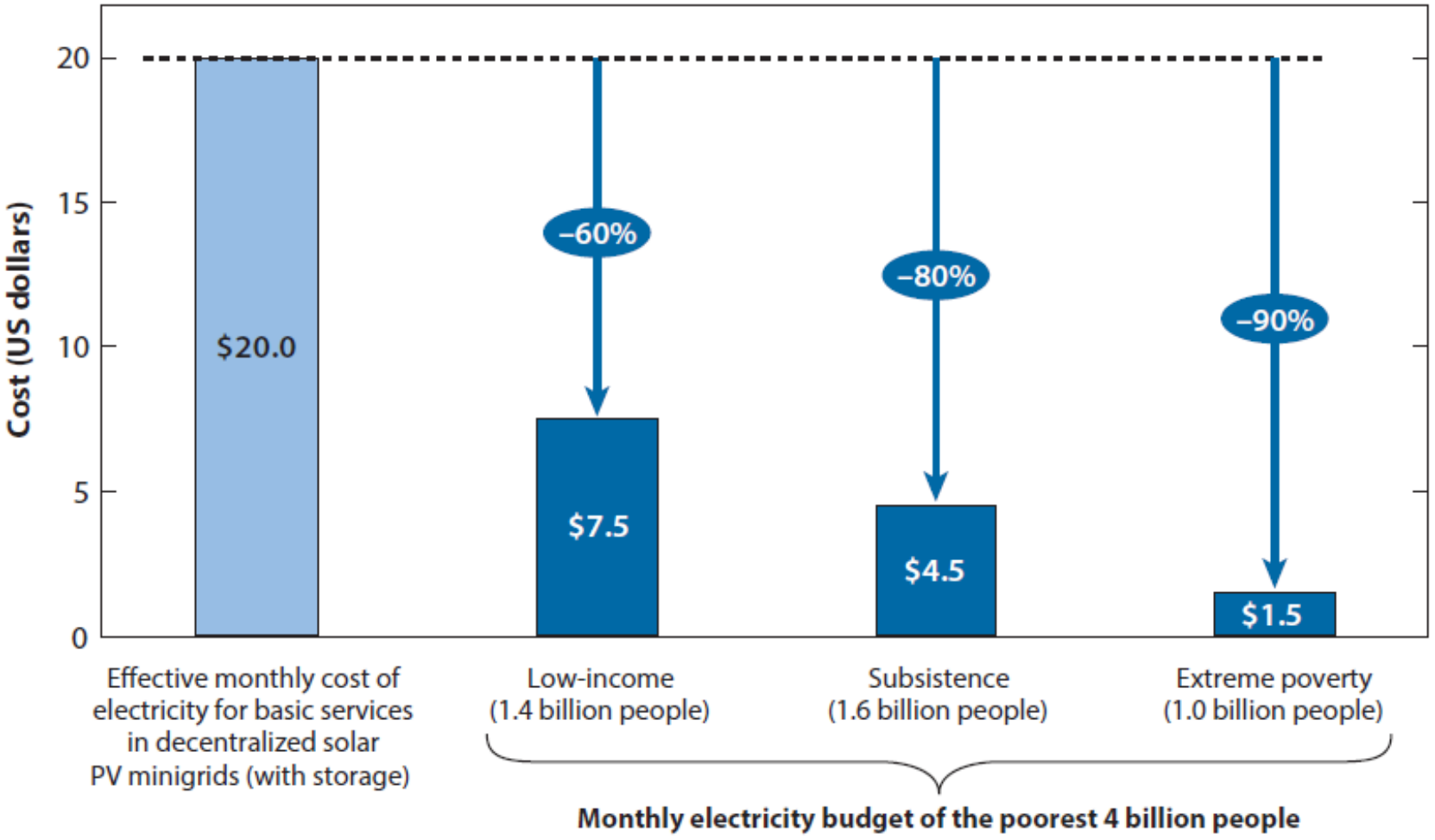
In the U.S., the top income quintile has received about 90% of all federal income tax credits made available to buy electric vehicles (Borenstein & Davis, 2016)

- **Residential Solar PV**

The affordability gap: even if electricity is made available in rural developing regions through decentralized solar PV minigrids, even if appliances are affordable, the cost of using those would be too high for rural users, without deep subsidies (Mitra & Buluswar, 2015)

Adapted from (Mullen & Marsden, 2016): Mobility justice in low carbon energy transitions
https://doi.org/10.1016/j.erss.2021.101916

Access to low-carbon technologies is mostly seized by high-income households



We consider poorest people living with < $5 per day (low-income to extreme poverty)

Low-income households typically spend 10% of income on energy (half for cooking)

-> electricity budget: $1.50-$7.50 per month

80kWh per month for basic services
= $20 per month (without subsidies)

More than double to over ten times what they can afford

Adapted from (Mitra & Buluswar, 2015): Universal Access to Electricity: Closing the Affordability Gap
https://doi.org/10.1146/annurev-environ-102014-021057

The justice implications of low carbon technology deployment

Four processes to describe the political ecology of low-carbon transitions

- Enclosure

when public assets are transferred into private hands. Corporate actors forcibly displace people to grow biofuel feedstock, green or blue grabbing for wildlife and marine conservation, see (Benjaminsen, and Bryceson, 2012) in the case of Tanzania

- Exclusion

dispossession (e.g., of land), exclusion of particular groups from decision-making

- Encroachment

when climate mitigation activities damage the natural environment, e.g., ecosystem degradation and destruction, e.g., to build wind farms or grow biofuels, threat to the sovereignty of indigenous people

- Entrenchment

when climate mitigation activities concentrate wealth and exacerbate inequalities, e.g., by diverting investments from poor communities, creating enclaves around wealthy districts, displacing the poor (Anguelovski et al., 2016)

Adapted from (Sovacool, 2021): Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation

https://doi.org/10.1016/j.erss.2021.101916

What policies are available to mitigate the burden of the low-carbon transition?

Europe's Just Transition mechanism, as part of the European Green Deal

The US Green New Deal Resolution

US Just Transition Fund, dedicated to helping coal-impacted communities

Canada's Coal Workforce Transition Fund

Also, national and regional initiatives in South Korea, Australia, Spain, UK, across Latin America and the Caribbean

Policies to accompany the occupational transition

- Workforce and economic diversification programmes, creation of special incentives for new businesses
- Workforce training, income to support individuals through retraining, but transportation to education facilities (technical centres, community colleges) where displaced workers can bridge their skills gaps is costly (Jolley et al., 2019)
- Relocation support
- Investments in coal-dependent communities, possibly funded by carbon tax revenues (Morris et al., 2019)
- Subsidized early retirement (e.g., common in the German coal sector). Alternative policy could be Wage Insurance Scheme to encourage job-to-job mobility (Haywood et al., 2021)

Adapted from (Carley & Konisky, 2020): The justice and equity implications of the clean energy transition https://doi.org/10.1038/s41560-020-0641-6

Policies for energy and technology access

- **Energy assistance and weatherization**

bill subsidies, support for those facing legal challenges with utility companies, home audits, providing efficient light-bulbs, window sealing, insulation, debt-forgiveness, waving or elimination of late fees, flexible deferred payment programmes

Examples of US programmes: LIHEAP

- **Expansion of energy technology access**

funds to deploy community-owned solar energy for low-income groups

funds to deploy electric vehicles as part of car-share programmes that serve low-income residents

deployment of charging stations in underserved neighbourhoods

Adapted from (Carley & Konisky, 2020): The justice and equity implications of the clean energy transition https://doi.org/10.1038/s41560-020-0641-6

Methods: how economic research can inform the debate

How can economic research help assess the impacts of low-carbon transitions, and inform the debate on how to alleviate these impacts?

Very diverse methods have been used to understand the impacts of the transition, including:

- econometric studies (e.g., using survey data on local unemployment effects of Australia's coal-fired power station closures, Burke et al., 2019)
- political economy case studies (e.g., in depth focus groups and interviews to understand the coal transition in the Appalachian, Carley et al., 2018)
- larger scale comparative assessments. e.g., (Gerber, 2011) on conflicts over industrial tree plantations, (Bulkeley et al., 2013) on climate justice in cities, (Avila, 2018) on conflicts over wind power deployment
- economic modelling (e.g., IAMs, microsimulation) to evaluate the effects of policies and attempt some policy recommendations
- surveys on the acceptability of climate policies, e.g., (Douenne & Fabre, 2022)

What can models tell us about how to achieve a just transition?

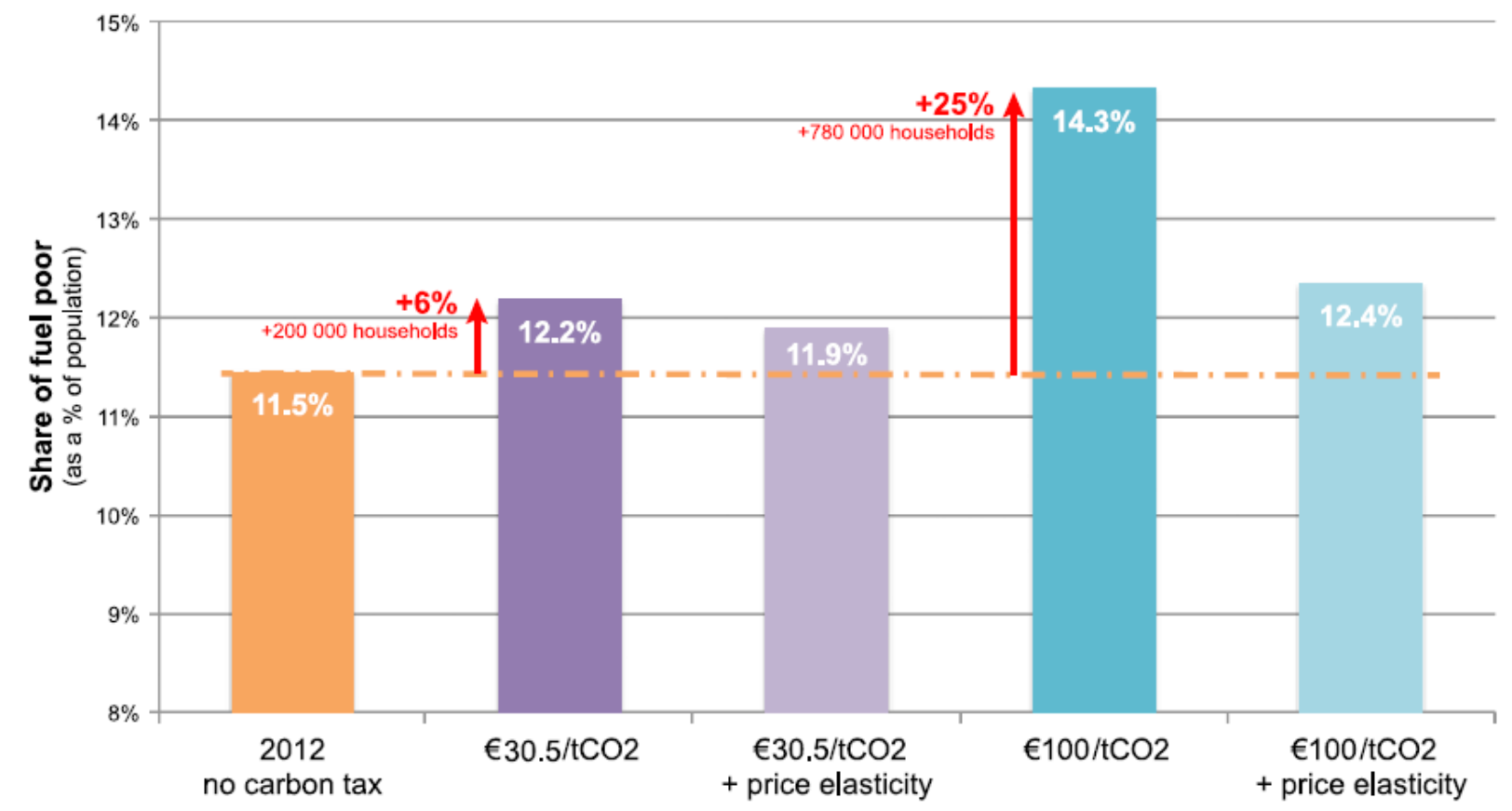
At the country level (France): Microsimulation (Berry, 2019)

At the regional level (EU): CGE (Fragkos et al., 2021)

At the world level : CBA-IAM (Budolfson et al., 2021)

MICROSIMULATION: the impact of a carbon tax on fuel poverty

Using French household survey data, household demand is modelled using price elasticity of demand for heating and transport



Energy poverty:

+6% with a 30.5 €/tCO2 tax

+25% with a 100 €/tCO2 tax

Scenario with and without price elasticity, i.e., with and without accounting for a different reduction of demand due to higher energy prices for different energy carriers and income classes

Limits: no interaction between households, no general equilibrium, short-term effects

Adapted from (Berry, 2019): The distributional effects of a carbon tax and its impact on fuel poverty: A microsimulation study in the French context

https://doi.org/10.1016/j.enpol.2018.09.021

Urban households are more exposed to the risk of fuel poverty

Impact of the carbon tax on fuel poverty by residential location and type of heating.

	No carbon tax		Carbon tax – €30.5/tCO_2 (no behaviour)			
	Number of fuel poor	Fuel poverty rate	Number of fuel poor	Fuel poverty rate	Additional fuel poor	% increase in fuel poverty
Total population	3 107 222	11.5%	3 307 212	12.2%	199 990	6.4%
City	1 940 595	10.8%	2 097 497	11.6%	156 903	8.1%
Suburb	855 283	12.1%	889 800	12.6%	34 517	4.0%
Isolated town	311 344	15.4%	319 915	15.8%	8 571	2.8%
Electricity	751 050	9.0%	751 050	9.0%	0	0.0%
Network gas	801 913	10.7%	874 151	11.6%	72 238	9.0%
Heating oil	514 199	17.0%	559 314	18.4%	45 115	8.8%
Wood	153 371	7.0%	153 371	7.0%	0	0.0%
Collective energy	745 808	14.6%	828 446	16.2%	82 638	11.1%

78% of households falling into energy poverty due to a carbon tax live in cities (160 000 households)

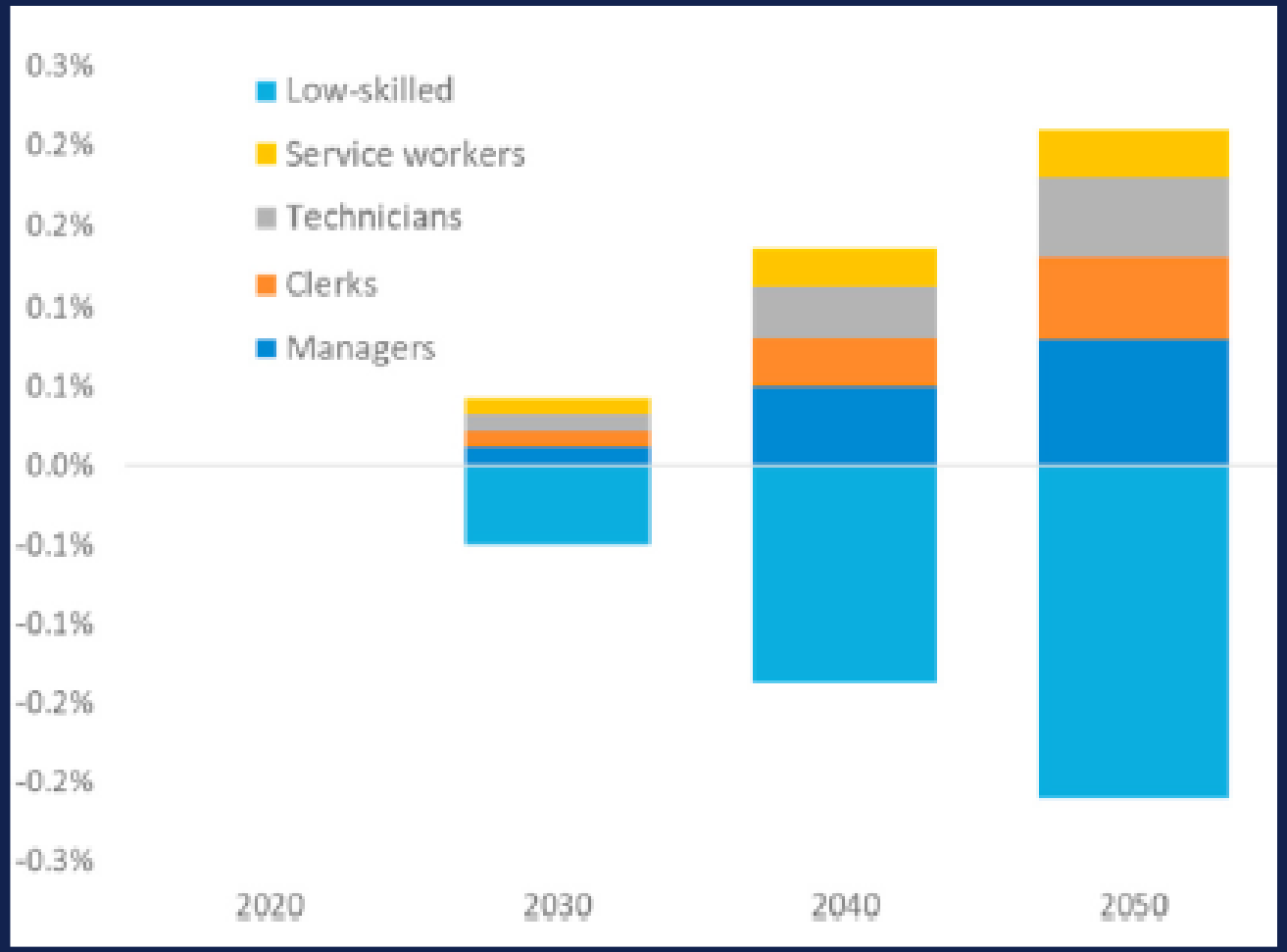
66% of French households live in cities, energy used for heating in cities is more carbon intensive (35% network gas, 27% central heating), while rural households primarily use electricity and wood

Fuel poverty could be reduced by 15% below pre-tax level by recycling 30%-40% of revenues to the 30% poorest households

Adapted from (Berry, 2019): The distributional effects of a carbon tax and its impact on fuel poverty: A microsimulation study in the French context

https://doi.org/10.1016/j.enpol.2018.09.021

CGE: Decarbonisation changes the structure of the economy



Changes in the composition of EU value added by skill in 2DEG compared to Reference

Soft-link of CGE GEM-E3 and B-U module with detailed representation of 10 income classes (also with different consumption and savings patterns), involuntary unemployment for 5 occupation and skill types

EU Member States

Mitigation affects employment and labour income

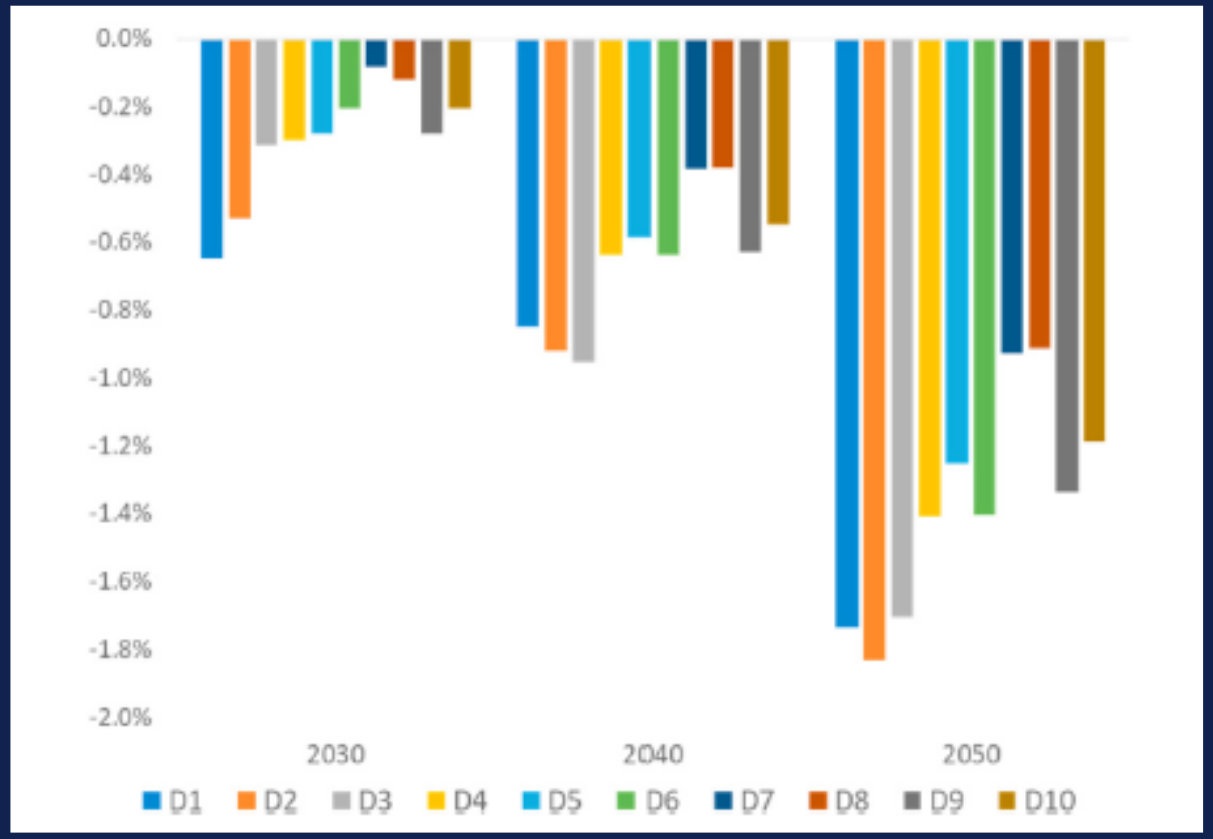
Structural change: some sectors lose, others gain

Decrease in low-skilled labour, increase in higher-skilled labour (technicians, managers)

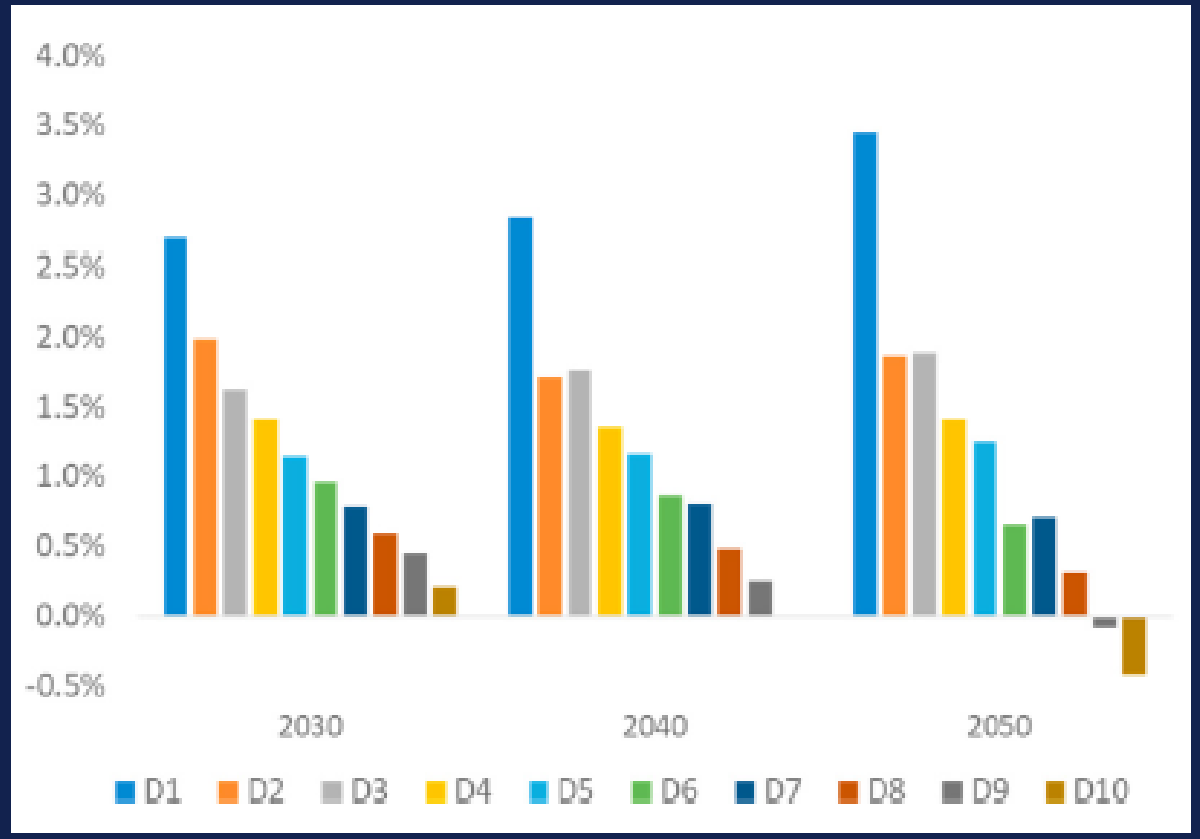
Adapted from (Fragkos et al., 2021): Equity implications of climate policy: Assessing the social and distributional impacts of emission reduction targets in the European Union https://doi.org/10.1016/j.energy.2021.121591

Lump-sum recycling mostly benefits lower income households

Changes in total income per EU decile in 2 ºC scenarios compared to Reference



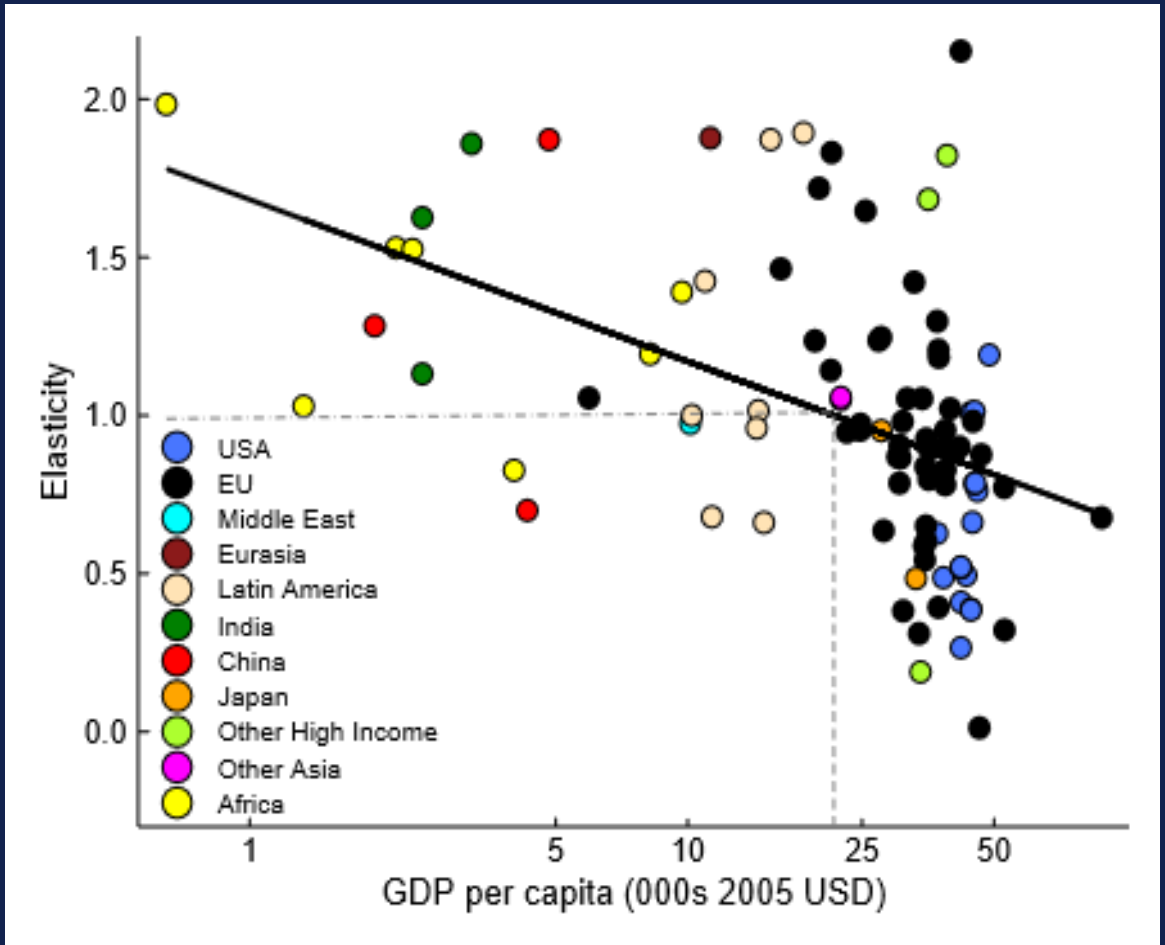
Revenue recycled via public budget



Revenue recycled via lump-sum transfers to households and reduced employers' social security contributions

Adapted from (Fragkos et al., 2021): Equity implications of climate policy: Assessing the social and distributional impacts of emission reduction targets in the European Union https://doi.org/10.1016/j.energy.2021.121591

CBA-IAM: The impact of carbon tax revenue recycling on inequality



NICE: CBA-IAM, adapted from RICE, 12 regions, damages and mitigation costs are distributed within regions across income quintiles

How are mitigation costs distributed?

From the literature: we estimate the consumption elasticity of the initial burden, an elasticity of x means that if a person's consumption increases by 1%, that person's initial burden increases by x%

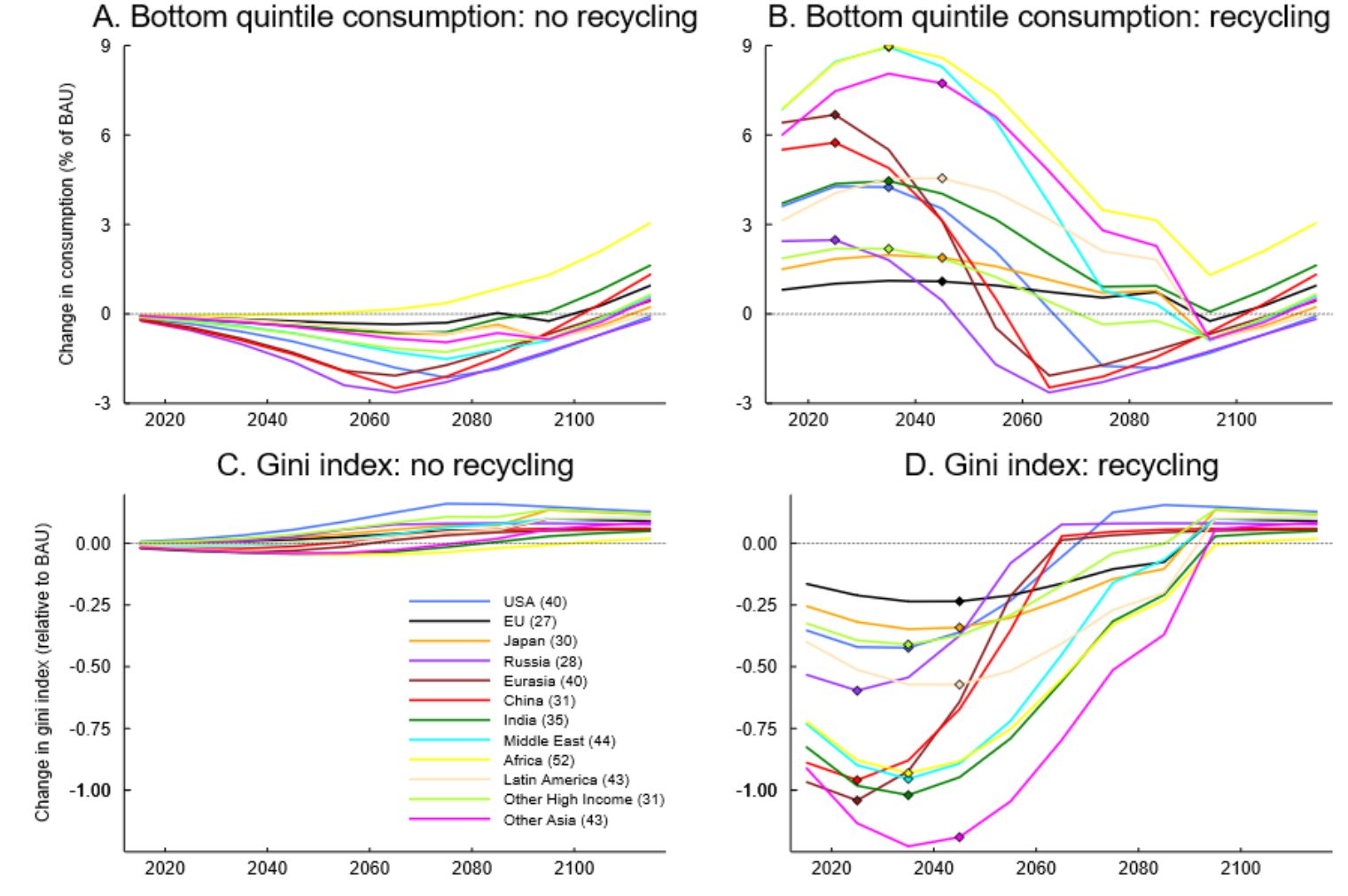
If x <1: initial carbon tax burden falls disproportionately on the poor (the tax is regressive before redistribution of revenues)

If x >1: initial carbon tax burden falls disproportionately on the rich (the tax is progressive before redistribution of revenues)

We assume the initial burden is distributed within a region on the basis of the consumption elasticity estimated by the best-fit line

Adapted from (Budolfson et al., 2021): Climate action with revenue recycling has benefits for poverty, inequality and well-being https://doi.org/10.1038/s41558-021-01217-0

Equal per capita recycling within regions reduces inequalities



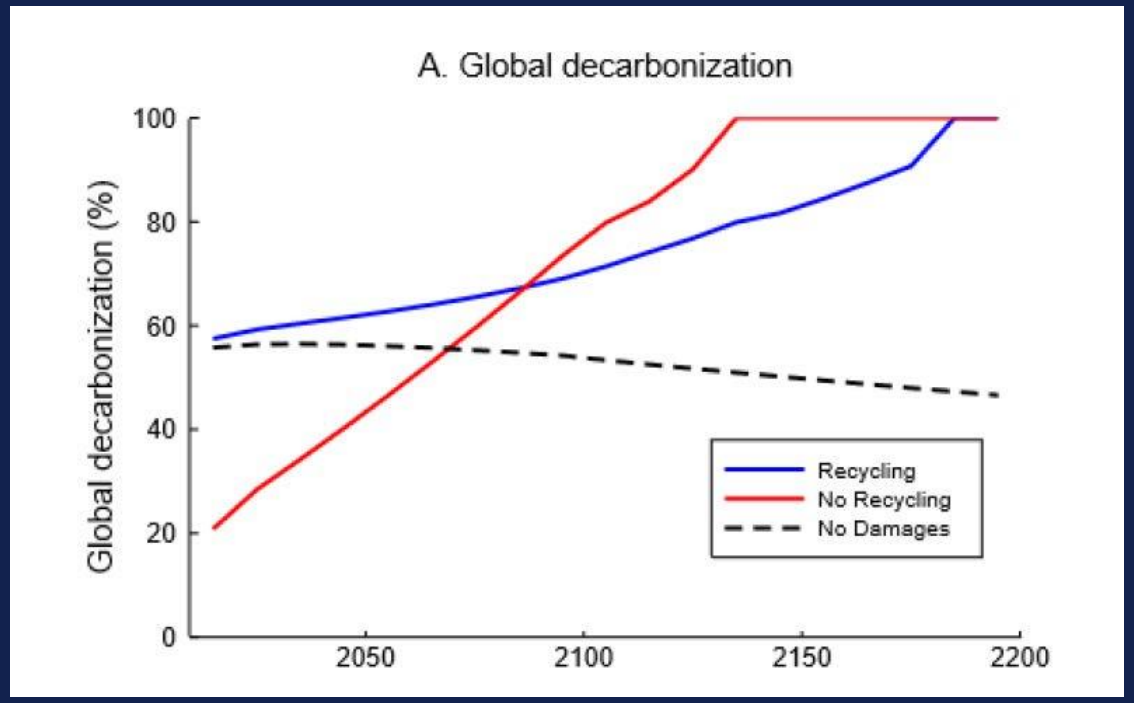
2 °C scenario

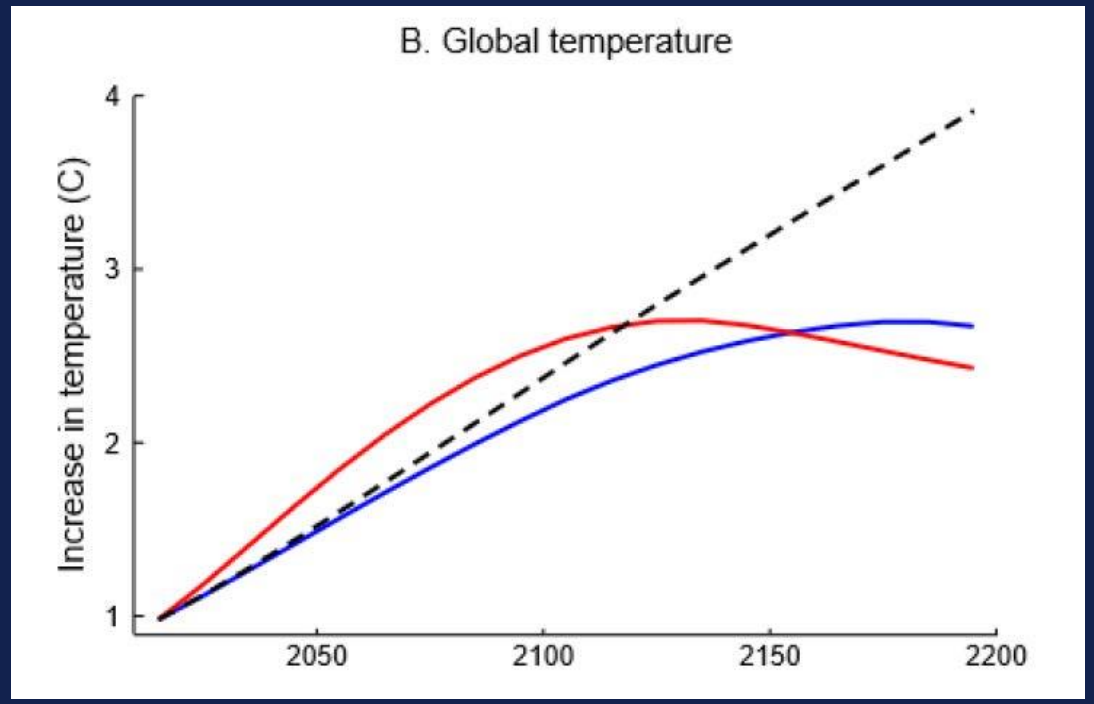
'no recycling': carbon tax revenues are returned in proportion to the initial burden

'recycling' : carbon tax revenue in each region are redistributed on an equal per capita basis

Adapted from (Budolfson et al., 2021): Climate action with revenue recycling has benefits for poverty, inequality and well-being https://doi.org/10.1038/s41558-021-01217-0

Trade-off between the benefits of lowering emissions and continued carbon tax revenue

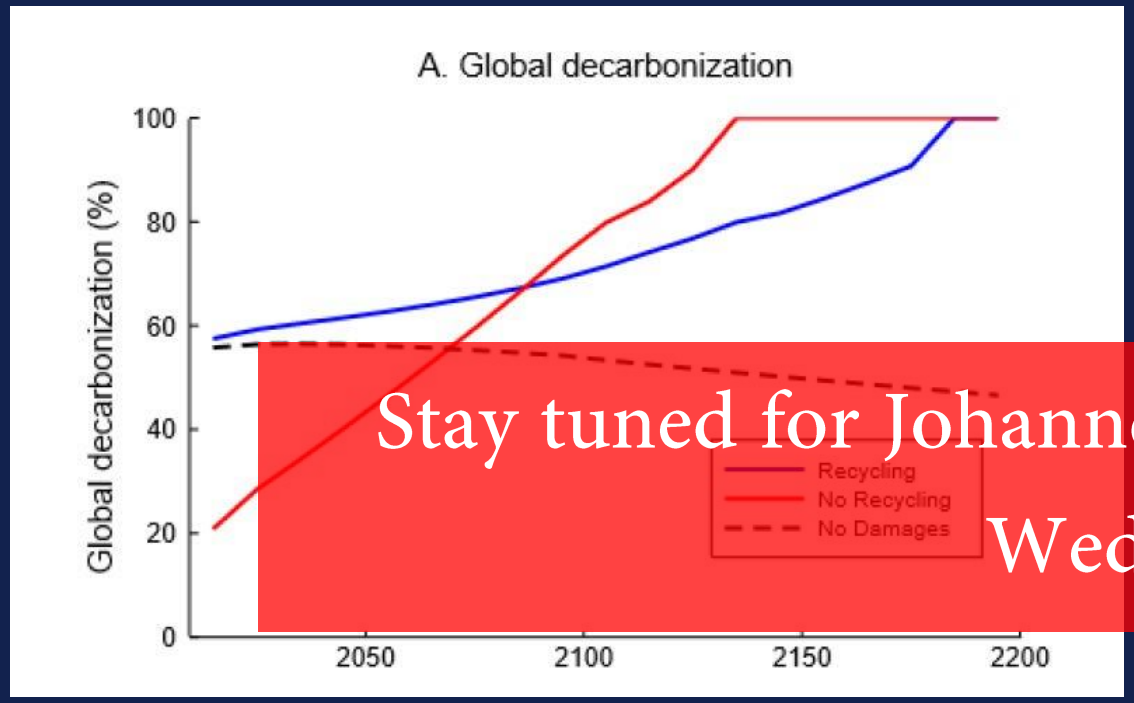


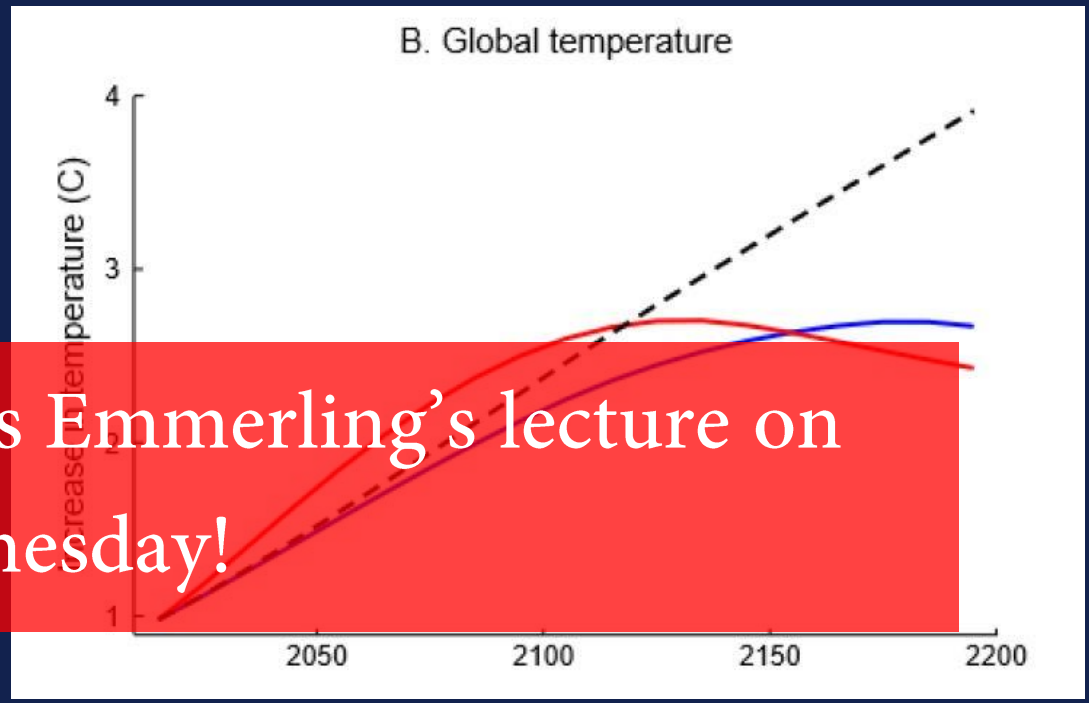


- Without equal per capita recycling: moderate ambition at first, to protect the current poor from high mitigation costs, then rapid increase in decarbonisation to avoid extreme warming
- With equal per capita recycling: high decarbonisation initially as there are dual benefits of redistributed revenue and lower future temperature, but full decarbonisation is postponed for many decades as redistribution continues

Adapted from (Budolfson et al., 2021): Climate action with revenue recycling has benefits for poverty, inequality and well-being https://doi.org/10.1038/s41558-021-01217-0

Optimal policy: trade-off between the benefits of lowering emissions and continued carbon tax revenue





Stay tuned for Johannes Emmerling's lecture on Wednesday!

- Without equal per capita recycling: moderate ambition at first, to protect the current poor from high mitigation costs, then rapid increase in decarbonisation to avoid extreme warming
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Adapted from (Budolfson et al., 2021): Climate action with revenue recycling has benefits for poverty, inequality and well-being https://doi.org/10.1038/s41558-021-01217-0

Some research gaps

No definite quantitative conclusion on the distribution of costs and benefits of low-carbon transformation among different actors, across time, on the scale of non-economic impacts.

- Geographical bias

Majority of the existing literature concerns the Global North

- Impacts outside energy production sectors

The transition will also affect industries that may survive but will have to evolve (e.g., car industry) How does the transition impact jobs on the value chain (e.g., suppliers of giant car companies)

- Policy evaluation

No systematic analysis or large comparative study of the effectiveness of workforce development and training programmes or energy assistance programmes

Consensus that the community should move to assess full policy packages rather than single instruments

Upcoming lectures and conferences

Tomorrow

Julie Rozenberg, “Climate change in low and middle countries: risks, trade-offs and opportunities”

Lucas Chancel, “How to decarbonize in an unequal world”

Wednesday

Johannes Emmerling, “The socioeconomic implications of transformation pathways in IAMs “

Thursday

Lola Vallejo, on the question of just transitions in climate negotiations

Now over to you

- What is missing?
- Do you find your area of research reflected in this overview?

What we hope you (and we) get from this Summer School

- An overview of the state-of-the art research on just transitions (yours and the faculty's)
- A good idea of current research frontiers to model just transitions
- New ideas for collaborations

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