PRESIDENTIAL
CLIMATE COMMISSION
TOWARDS A JUST TRANSITION

IPCC AR6 Synthesis Report

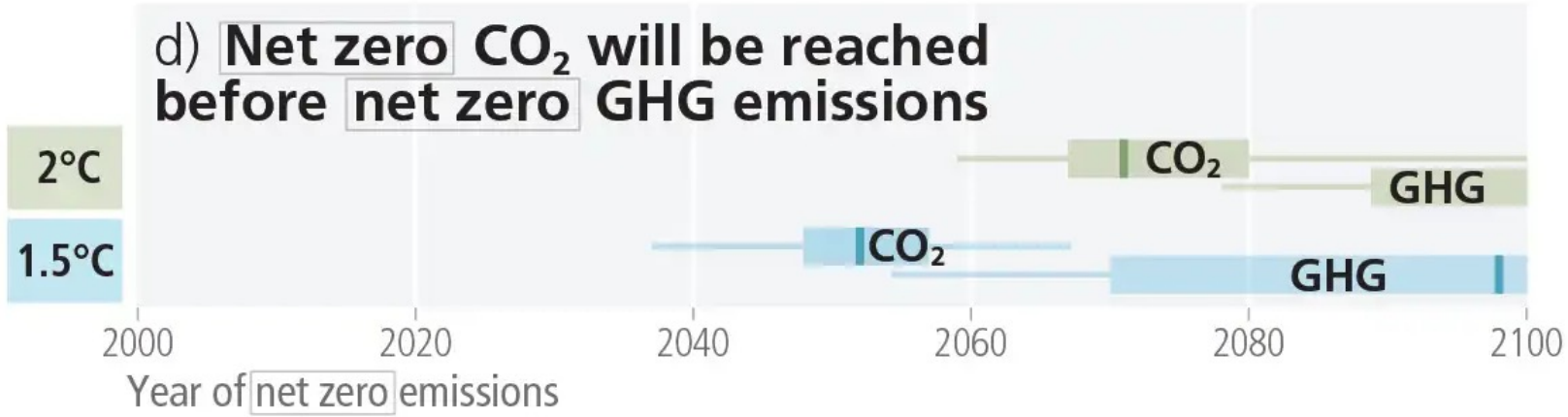
Climate change impacts, adaptation, and mitigation

Mitigation
Synthesis Report Core Writing Team member
Prof Harald Winkler

COLLOQUIUM BY PRESIDENTIAL CLIMATE COMMISSION
5 May 2023

[Matt Bridgestock, Director and Architect at John Gilbert Architects]

Differences between net zero CO2 and net zero GHG



- Differences
  - In global modelled mitigation pathways, net zero CO2 come earlier than net zero for all GHG
  - CO2 is the only gas which we know how to remove from atmosphere, so for net zero GHG emissions, have to remove additional CO2 to compensate for residual emissions of other GHGs
  - Other gases have to be converted to CO2 –equivalent; metrics are complex
- 'Defintion (for later reading)
  - Net zero CO2 emissions, or 'carbon neutrality': "Condition in which anthropogenic carbon dioxide (CO2) emissions associated with a subject are balanced by anthropogenic CO2 removals …" (definition continues)
  - Net zero GHG emissions or GHG neutrality "Condition in which metric-weighted anthropogenic greenhouse gas (GHG) emissions associated with a subject are balanced by metric-weighted anthropogenic GHG removals" (definition continues)
  - Note that "climate neutrality" is not definied in IPCC glossary – because interactions are complex (incl **inertia in physical climate system components** (ocean, cryosphere, land surface), carbon cycle; other climate forceres greenhouses gases, **aerosols and their precursors**. Climate sensitivity - **different climate response** time scale of each climate forcer. A specific sub-category of zero emissions commitment is the Zero CO2 Emissions Commitment which refers to the climate system

By 2035, global emissions need to be around 60% below 2019 levels

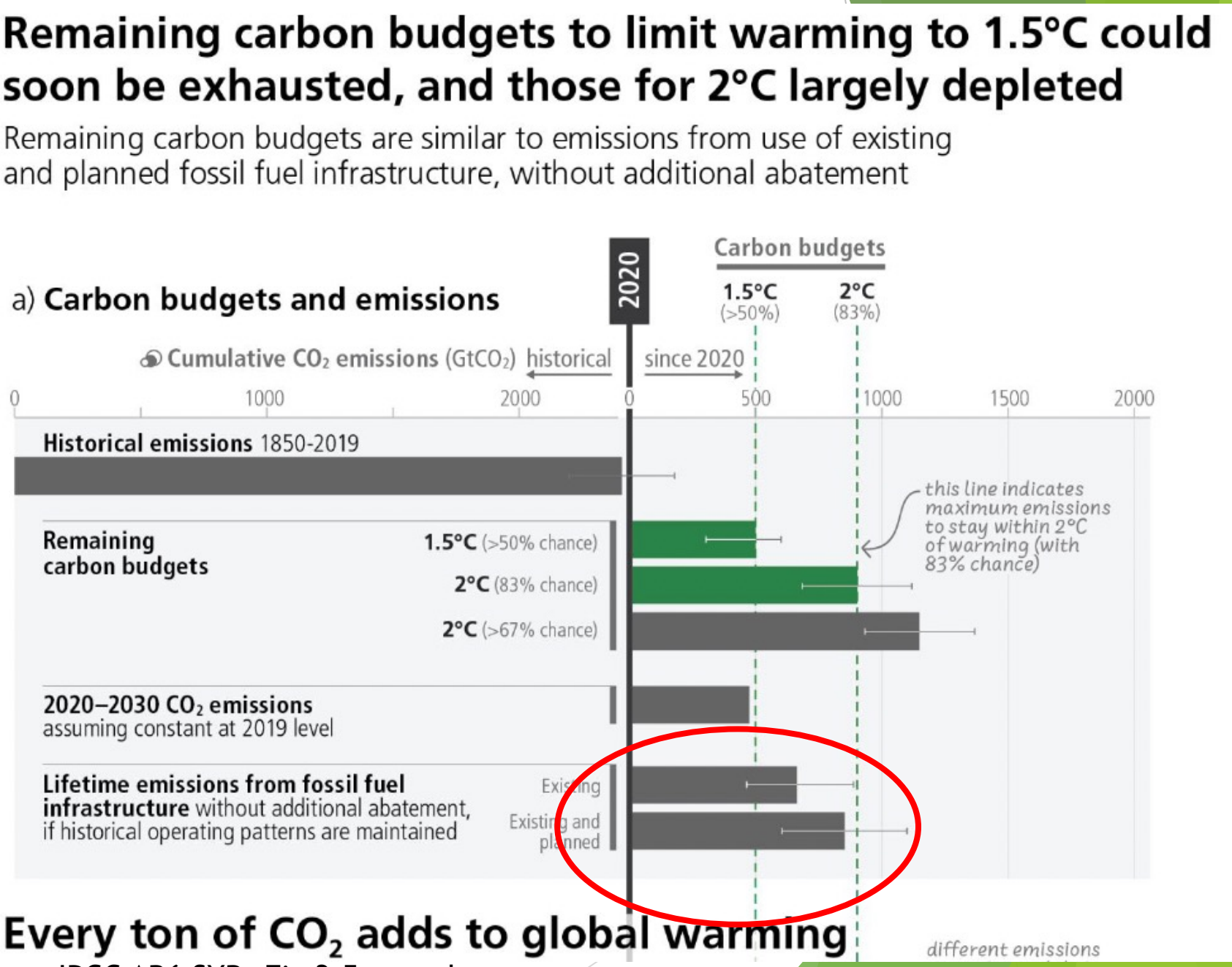
Table XX: Greenhouse gas and CO_2 emission reductions from 2019, median and 5-95 percentiles {3.3.1; 4.1; Table 3.1; Figure 2.5; Box SPM1}

		Reductions from 2019 emission levels (%)			
		2030	2035	2040	2050
Limit warming to1.5°C (>50%) with no or limited overshoot	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
	CO_2	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]
Limit warming to 2°C (>67%)	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]
	CO_2	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]

- 2035: end year of 2nd NDC
- Note 60% is median in wide range, and global number
- What each country does depends on equity
  - What will SA contribute, when we prepare our next NDC, starting in 2024 and communicating in 2025?

Future CO_2 emissions from existing fossil fuel infrastructure exceed remaining global carbon budget for 1.5 °C

- High confidence for 1.5 °C (50%) and
  - and 83% likelihood that future FFI emissions equal to °C, existing *and planned*, same operations without CCS

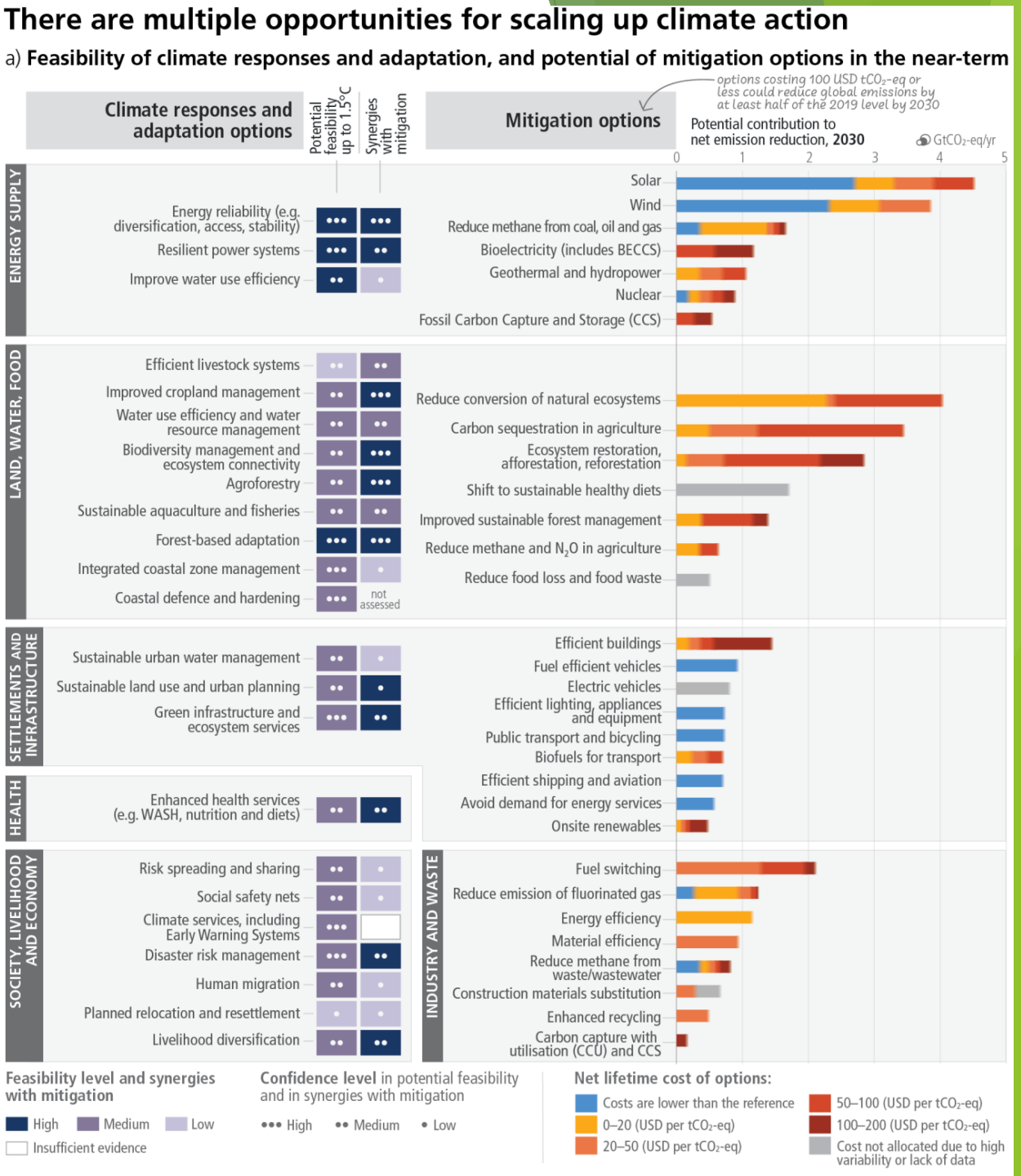


IPCC AR6 SYR, Fig 3.5, panel a

Options available for system transformations

- *Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all.*
- *Scale up mitigation and more transformational adaptation*
- *Feasible, effective, and low-cost options*
  - *But are we taking up these options*
  - *Evidence suggest globally not nearly enough*
  - *… and in SA? For discussion …*

IPCC SYR Fig SPM.7



Finance and transformative change

- Currently no model for private sector finance of adaptation for highly vulnerable (e.g., informal settlements).
  - What does this mean for local public sector finance in SA for adaptation for the most vulnerable?
- Finance for mitigation
  - Despite some divestment by some financial institutions, frends of investment in fossil fuel infrastructure (FFI) continue
  - Pathways to below 2 °C could strand considerable FFI - globally discounted value projected around USD1–4 trillion from 2015 to 2050
  - Key renewable energy technologies are least cost – wind and solar PV can be financed privately
  - Accelerated international financial cooperation a critical enabler of low-GHG and just transitions

Equity can enable ambition

- **Current trends "incompatible with a sustainable, equitable world"**
  - Burning fossil fuels for more than a century
  - Unequal and unsustainable energy and land use
  - These trends are what got us to 1.1 °C of global warming already
  - More frequent and intense weather events – increasing impacts (observed, not only projected. Leading to great need for adaptation, and losses and damages – and higher costs
  - **"Prioritising equity, climate justice, social justice, inclusion and just transition processes can enable adaptation and ambitious mitigation actions and climate resilient development"**
  - Equity can enable ambition
  - Distributional, recognitional, procedural dimensions of equity
  - SYR builds on assessments in WGII and WGIII
  - Clear role for just transitions – are they only about energy and mitigation? For discussion …
- All of society, all of economy approach
  - Governments working together multi-laterally, at national and local government scale, with civil society, including businesses, youth, women, labour, media, Indigenous Peoples and local communities

Conditions that constrain climate resilient develop and conditions that enable shifts of development pathways to sustainability

- Constraints are important reasons why techno-economic options not taken up
- IPCC on global enabling conditions
- Implementing development pathways
- Inclusive governance and consultative institutions
- Coordination of integrated policies

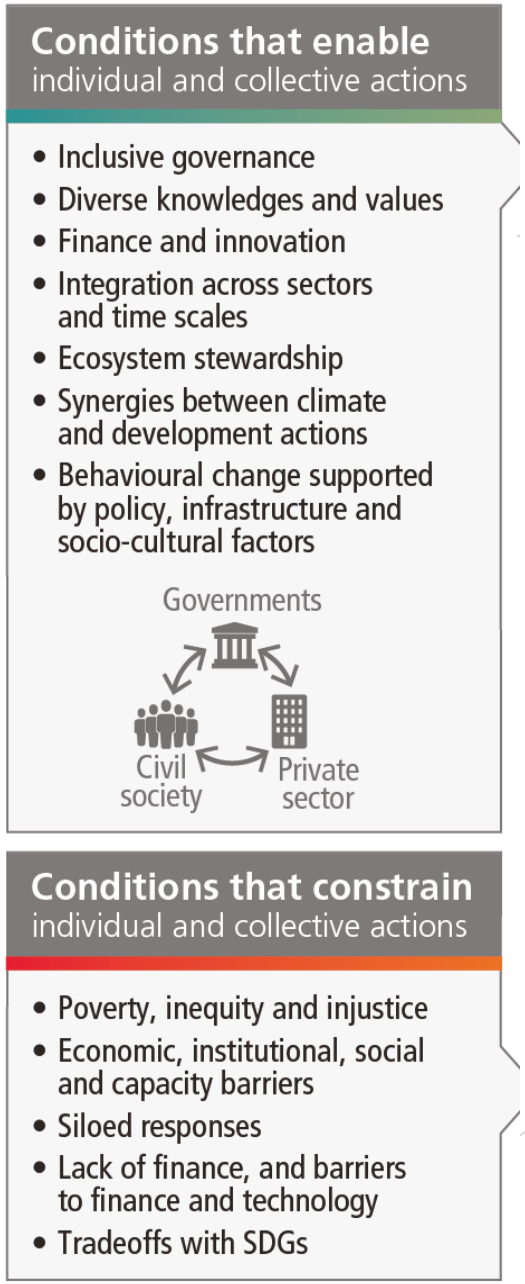


Fig SPM.6, panel on LHS

Integrated policy packages to shift development pathways

- **Extent to which current and future generation will experience a hotter and different world depends on the choices made in this decade.**
  - **These choices will impact life on earth for thousands of years**
  - **Choices about development**
  - Many co-benefits for development of climate action (both adaptation and mitigation)

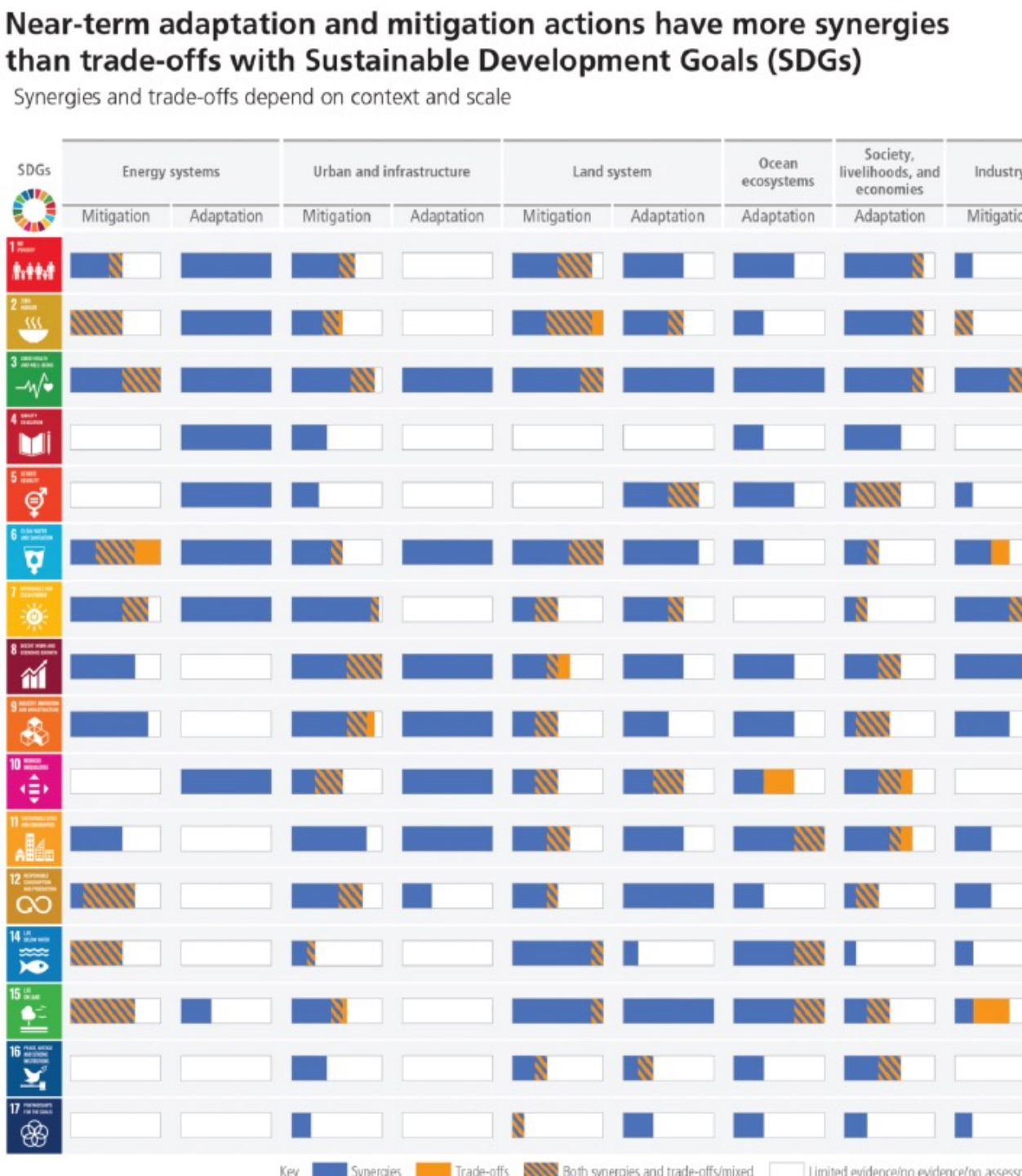


Fig 4.5, SYR longer report

Thank you

Chris Trisos

Debra Roberts

Prof Harald Winkler, University of Cape Town, Harald.Winkler@uct.ac.za