Global Warming of 1.5°C

Presentation to the wrap-up of the Talanoa Dialogue preparatory phase

COP24, 6 December 2018

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INTERGOVERNMENTAL PANEL ON climate change

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Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

Climate change is **already** affecting people, ecosystems and livelihoods around the world

Limiting global warming to 1.5°C **is not impossible**, but would require unprecedented transitions in all aspects of society

There are clear benefits to keeping warming to 1.5°C rather than 2°C or higher

Limiting warming to 1.5°C **can contribute** to achieving other world goals

- Every bit of warming matters
- Every year matters
- Every choice matters

Where are we now?

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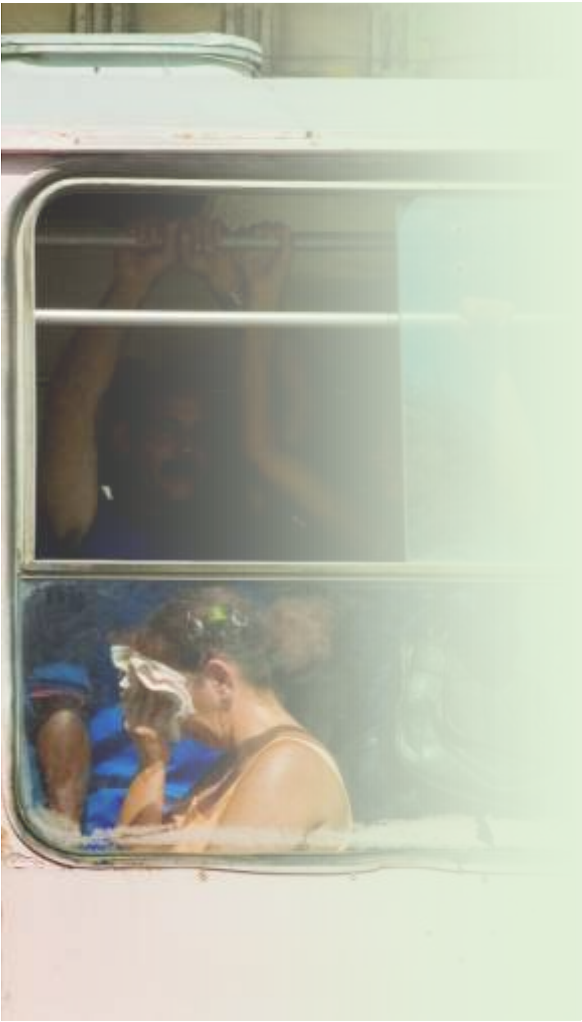
Ashley Cooper / Aurora Photos

Where are we now?

Since pre-industrial times, human activities have caused approximately 1.0°C of global warming.

- At current rate, would reach 1.5°C between 2030 and 2050
- Past emissions alone do not commit the world to 1.5°C
- Already seeing consequences for people, nature and livelihoods

Where do we want to go?



Where do we want to go?

At 1.5°C compared to 2°C:

- There are clear differences in climate and extremes between today, a 1.5°C and a 2°C warmer world
- Less impacts from extreme weather where people live
- By 2100, global mean sea level rise will be around 10 cm lower but will continue to rise for centuries
- 10 million fewer people exposed to risk of rising seas and less coastal ecosystems exposed

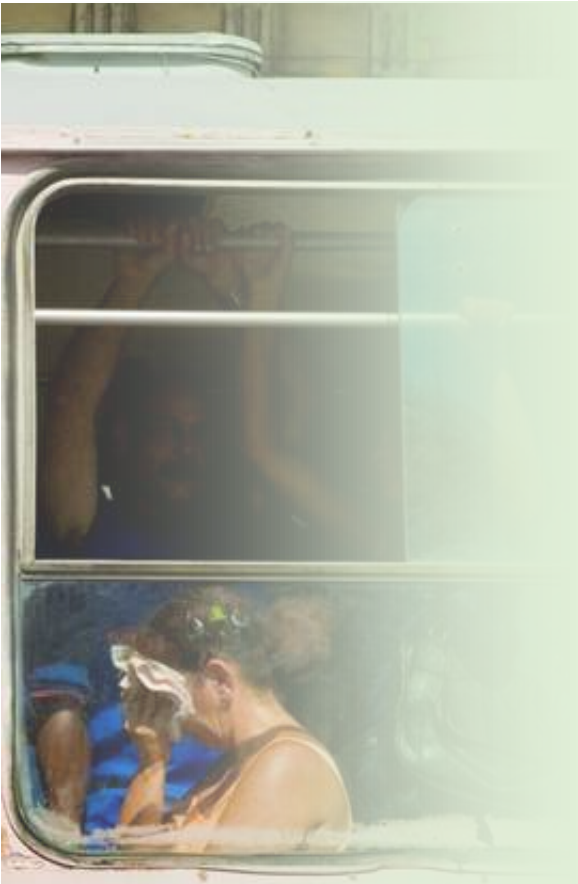
Jason Florio / Aurora Photos

Where do we want to go?

At 1.5°C compared to 2°C:

- Smaller reductions in yields of maize, rice, wheat and sorghum
- Global population exposed to water stress is up to 50% less, also less water stress for ecosystems
- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050
- Lower impact on biodiversity and species
  - High risk of losing 70-90% of warm water coral reefs and their services to humankind, even higher at 2°C

Andre Seale / Aurora Photos



Where do we want to go?

- At 1.5 and even more so at 2°C, there is disproportionately high risk for Arctic, dryland regions, small island developing states and least developed countries

At 1.5°C compared to 2°C:

- Lower risks for health, livelihoods, food security, water supply, human security and economic growth
- A wide range of adaptation options can reduce climate risks; less adaptation needs at 1.5°C

Jason Florio / Aurora Photos

How do we get there?

Energy system transitions in numbers

Increase in primary energy compared to 2010

	Pathway 2 (Sustainability Focus)		Pathway 3 (Middle of the Road)	
	2030	**2050**	**2030**	**2050**
Coal	-61%	-77%	-75%	-73%
Oil	-13%	-50%	-3%	-81%
Gas	-20%	-53%	+33%	+21%
Non-biomass renewables	+470%	+1327%	+315%	+878%
Biomass	0%	+49%	+36%	+121%
Nuclear	+83%	+98%	+98%	+501%
Final energy	-5%	+2%	+17%	+21%
BECCS ($GtCO_2$)	0.005	1.4	0.07	1.3
Fossil CCS ($GtCO_2$)	0.5	4.9	1.8	7.3

Robert van Waarden / Aurora Photos

How do we get there: Energy system transitions

- Decarbonization of electricity
  - Renewable energy
  - Integration of renewables into energy systems
  - Exiting fossil fuel generation
- Electrification of energy end use
  - Vehicles, Industry, Buildings
- Energy efficiency
  - All sectors
- Adaptation of key infrastructure to climate change

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How do we get there: Industrial system transitions

- Energy efficiency
- Electrification and hydrogen
- Industrial carbon capture, utilization and storage
- Bio-based industry
- Circular economy

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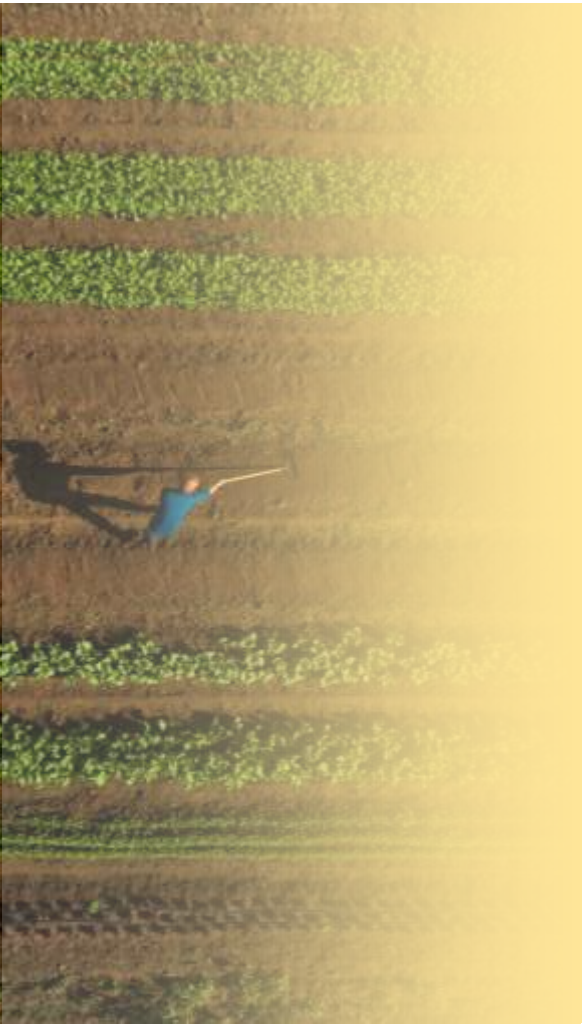
How do we get there: Urban and infrastructure systems transitions

- Land use and urban planning
- Adoption of low–carbon transport fuels (e.g. electricity, hydrogen)
- Shifts to public transportation and sharing, non-motorized transport
- Smart grids
- Efficient appliances
- Low/zero-carbon buildings
- Green infrastructure
- Building codes and standards

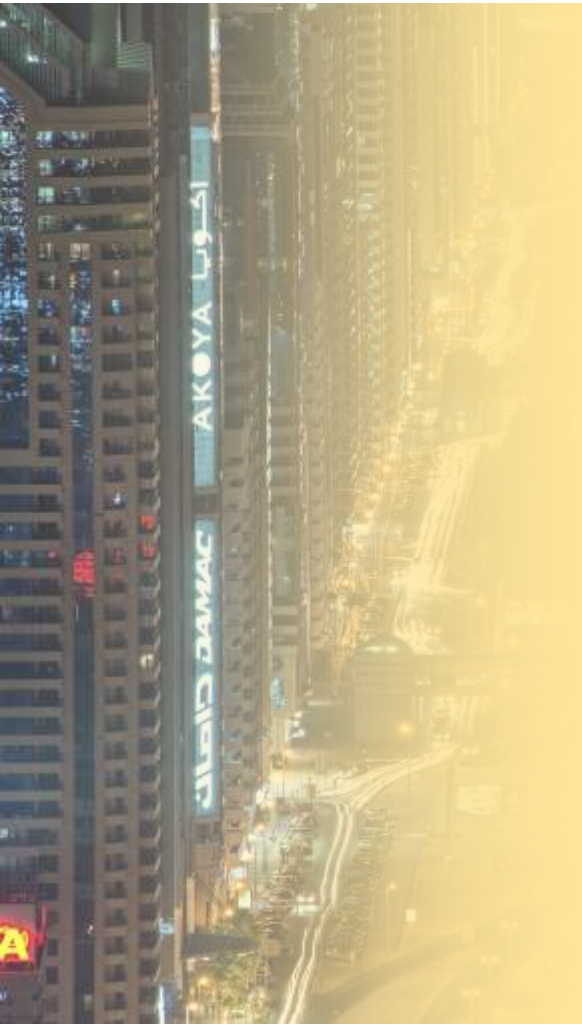
Robert van Waarden / Aurora Photos



How do we get there: Land and ecosystem transitions

- Afforestation and reforestation
- Agroforestry
- Sustainable intensification of agriculture
- Conservation agriculture
- Soil management
- Livestock management
- Ecosystem restoration, biodiversity management
- Wetland management
- Building on indigenous knowledge and local knowledge

Robert van Waarden / Aurora Photos



How we get there: Within and across systems

- Integrated planning of transportation and urban form at the city level
- Initiatives that engage companies
- Re-directing financial flows towards low-carbon assets
- Integrated risk sharing and spreading
- Packages of innovation policies that combine R&D with support for technology diffusion
- Social protection for the poor and vulnerable
- International, regional and local cooperation

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How do we get there: Sustainability

- Benefits and trade-offs with SD balancing social well-being, economic prosperity, environmental protection
- Pathways with low energy demand, low material consumption and low carbon food have the highest co-benefits with sustainable development.
- SD can support and enable the systemic transitions and transformation

Ashley Cooper/ Aurora Photos

How do we get there: Enabling conditions

Strengthened multi-level governance and institutional capacity

Strengthened policy tools

Technological innovation

Changes in lifestyle and behaviour

Transfer and mobilization of finance

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How do we get there: Ethical and fair transitions

- A careful mix of policies will allow mitigation and adaptation to be pursued alongside sustainable development.
- Low carbon, climate resilient development pathways
- This implies cooperation, multi-level governance, innovation and the re-direction of investment flows.

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Urgent and far reaching action

Urgent and far-reaching action

- Global carbon emissions peak before 2030 in all pathways compatible with 1.5°C warming
- Emissions of carbon dioxide fall by 45% by 2030, reaching net zero around 2050, with deep cuts in methane and other emissions.
- Ethical and fair transitions
- Limiting global warming to 1.5°C is not impossible, but political and societal will to accelerate transitions is key.

Ashley Cooper/ Aurora Photos

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