



Institute
and Faculty
of Actuaries

IFoA Life Conference

Climate inequality and the just transition:
actuarial perspectives on fairness and risk

Clare Keeffe
Helen Nicholas
Nick Spencer

From enlightened attention to purposeful intention



What if the hole is at your end?

"You must be the change you wish to see in this world", Mahatma Gandhi

“An actuary who is just an actuary, is not an actuary”, Frank Redington

“An actuary who is a just actuary, is not just an actuary”,
IFoA Inequality of Climate Change Working Party

Dimensions of Climate Inequality

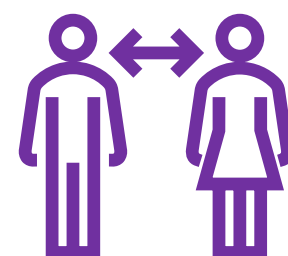
Key themes include uneven distribution of impacts among individuals, regions, communities; heightened vulnerability and disproportionate impact, unequal access to resources and capacity to adapt and mitigate impacts; undermine sustainable development

Intra-generational

Geographical



Gender



Socio-Economic



Inter-generational



Intersectionality:
Individuals do not fit neatly into a single group, and careful consideration is essential when developing climate solutions.

Source:
Please refer to the paper published by the Inequality of Climate Change Working Party for additional references.
https://vle.actuaries.org.uk/pluginfile.php/154436/mod_resource/content/2/climate-inequality-and-just-transition.pdf,
Climate Inequality & Just Transition An Introduction for actuaries (2024)

Let's understand some related terms



1 Inequality

Two individuals have unequal access to the fruits



2 Equality

Same type and number of tools are given to the two individuals, but the access to the fruits is still different.



3 Equity

An equitable solution should provide different tools for everyone to achieve the same outcome.



4 Justice

Justice fixes the systems that leads to long-term, sustainable, equitable access for future generations.

Wider perspective: Climate justice

What is climate justice?

IPCC report states that:

“Climate Justice links development and human rights to achieve a human-centred approach to addressing climate change, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly.”



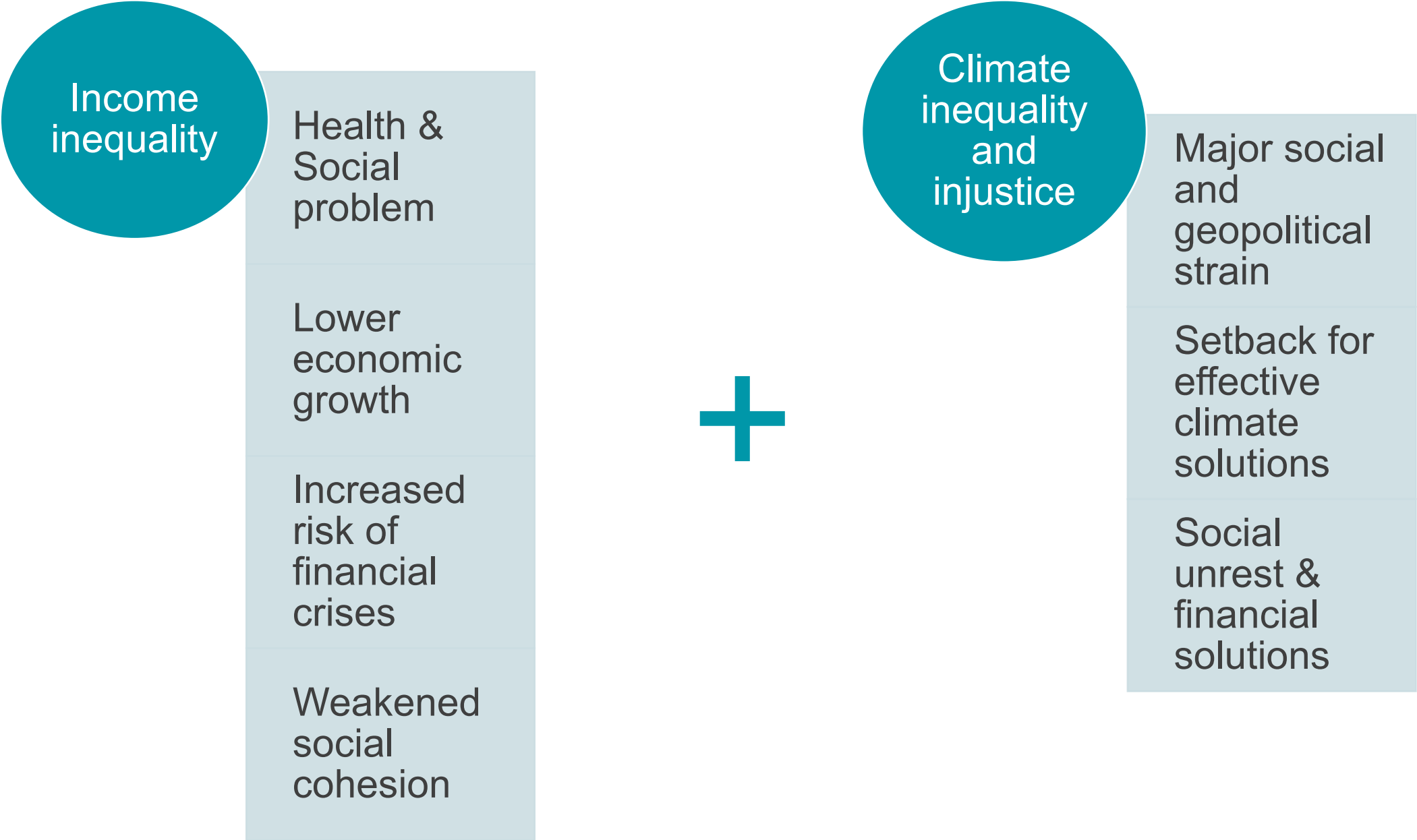
Inter-generational

Socio-economic

Geographical

Does that matter to everyone?

Climate injustice worsens the consequences of income inequalities



Source:
Please refer to the paper published by the Inequality of Climate Change Working Party for additional references.
https://vle.actuaries.org.uk/pluginfile.php/154436/mod_resource/content/2/climate-inequality-and-just-transition.pdf, Climate Inequality & Just Transition An Introduction for actuaries (2024)

IPCC implicitly highlights the role of actuaries

A just transition lens highlights priority areas and levers for financial action

Sustainability transformations will only be successful if they are seen to be fair and inclusive

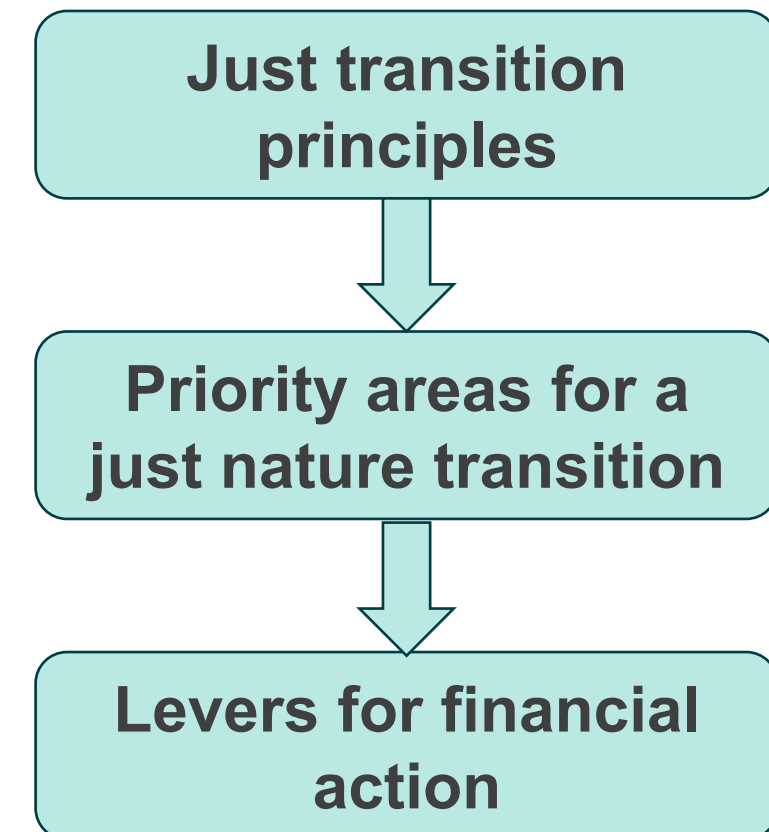
“Climate resilient development is enabled when governments, civil society and the private sector make inclusive development choices that prioritise risk reduction, equity and justice.” IPCC AR6

IPCC AR6 recommends (actuarial = ✓)

- ✓ Universal access to healthcare
- ✓ Weather and health insurance, social protection and adaptive safety nets
- ✓ Adaptation supporting social safety nets have strong co-benefits with several sustainable development goals
- Land restoration contributes to mitigation and adaptation

Just Nature Transition

Integrating climate, nature and social considerations



“One of the reasons why action on climate and nature remains inadequate in all parts of the world is that it still largely fails to recognise the intrinsic human dimension.”

Better fare?

Understanding fairness not trivial – but build from definition to integration and assurance (scanning to renew)

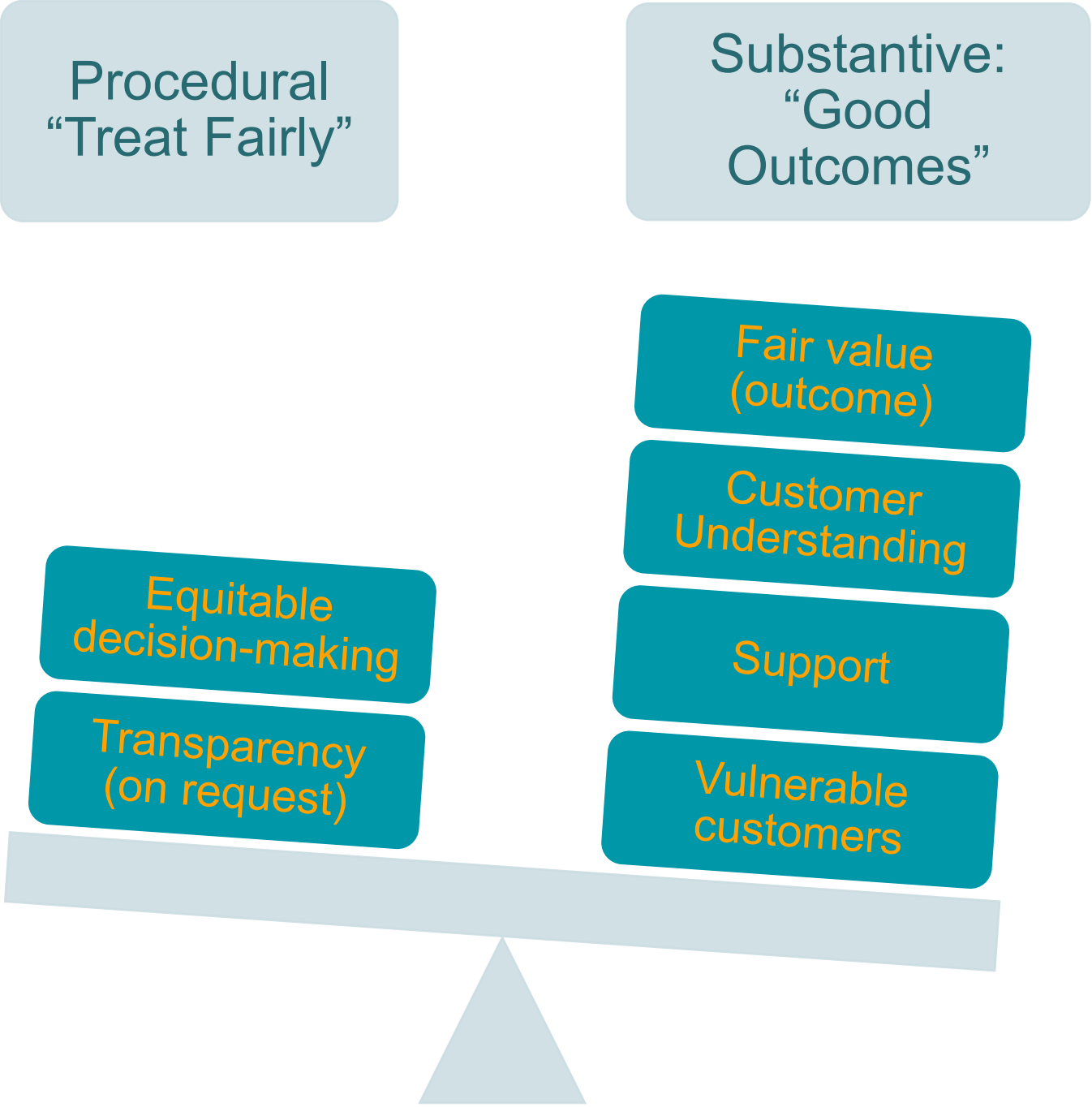


A four-step approach to fairness

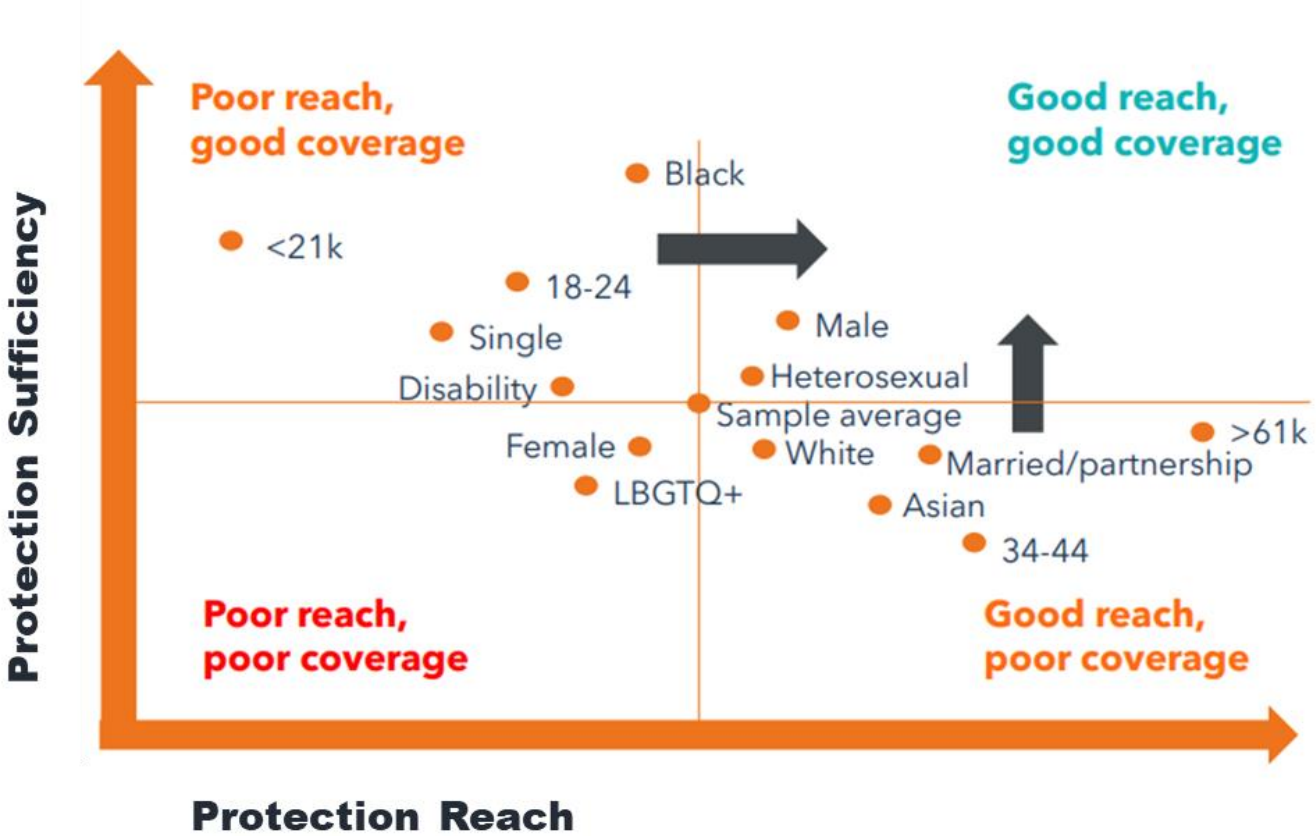
DEFINE	INTEGRATE
Develop a framework of what “fairness” means for you	Integrate into business strategies, operations and practices
ASSURE	SCAN
Embed monitoring and assurance processes to evaluate outcomes	Horizon scan for continuous improvements and remediations

See <https://www.milliman.com/en/insight/fairness-in-uk-health-insurance> for further discussion

New fairness lens from process to outcome...to opportunity?



Underserved communities are also business opportunities?



Source: Pacific Re, Beneath the Surface Serving the Underserved, 2024 Report

Algorithmic Fairness: fairness through an actuarial lens?

We have the maths to rebuild them

DATA

OR

MODEL

OR

SCORING

Pre-processing

Consists in producing a set of corrected data (modifications to existing data / addition of synthetic data).

✓ **If biased data**

✓ **Model agnostic**

✗ No “direct” control of model output bias

In-processing

Integrating fairness constraints into the objective function used to calibrate the model

✓ **Remains in model class**

✗ Dependent on this model class

✗ Time-consuming (hyper-parameters...)

Post-processing

Adjustment of predicted scores to optimize fairness metrics under maximum performance constraints

✓ **«Direct» bias control**

✓ **Model agnostic**

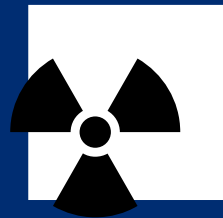
✗ Final predictions do not remain in the model class (e.g. not GLM)

Source: See [Trustworthy artificial intelligence in insurance: Navigating fairness and performance in predictive modelling](#) for further discussion

How can actuaries contribute?

Understanding the risks

- Modelling and risk assessments
- Systemic interconnectedness
- Risk management and business strategies
- Social discounting factors



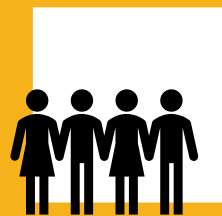
Developing and providing solutions

- Financial systems and pro-social investments
- Eligibility and affordability



Community engagement

- Local community voices
- Contribute to public discourse
- Public/private partnerships, social bonds, and innovative solutions
- Sustainable Development Goals

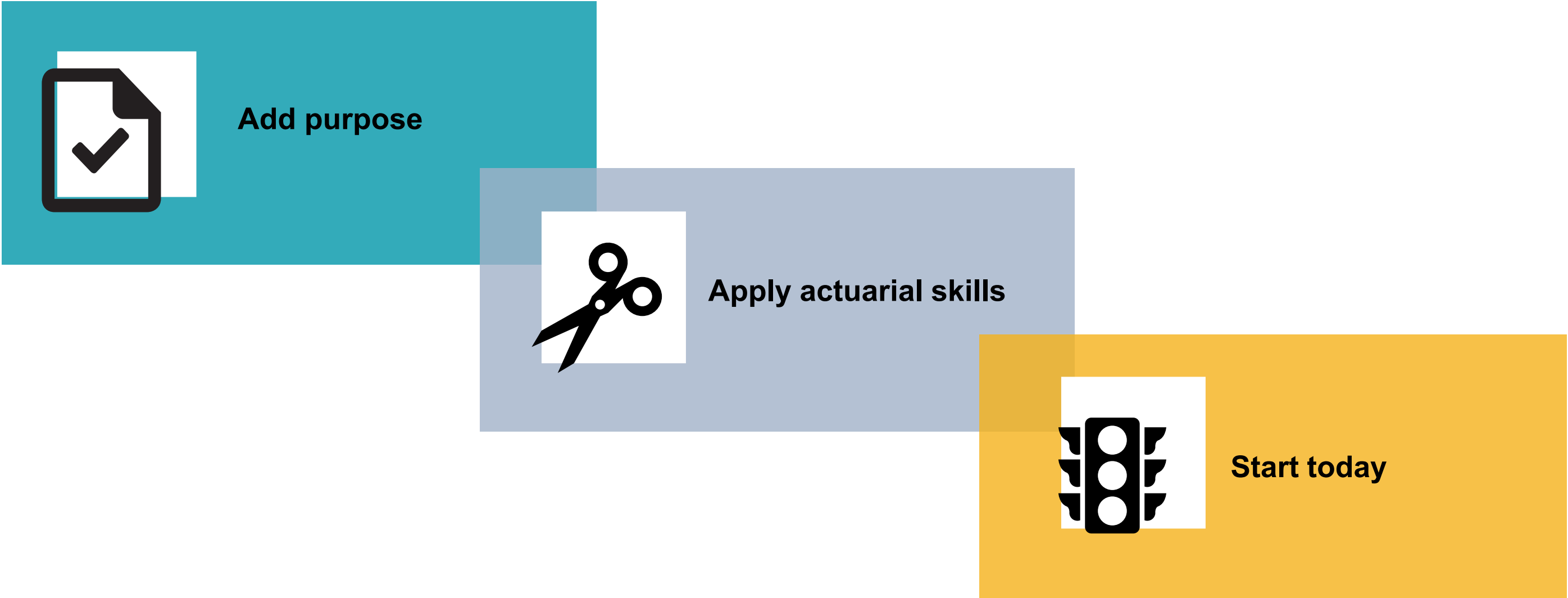


Individual impact

- Everyday choices
- Raise awareness and participate
- Keep learning



Act now!





Questions



Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are solely those of the individual presenters in a professional capacity and not necessarily of any of the organisations they represent.



Institute
and Faculty
of Actuaries

Thank you!