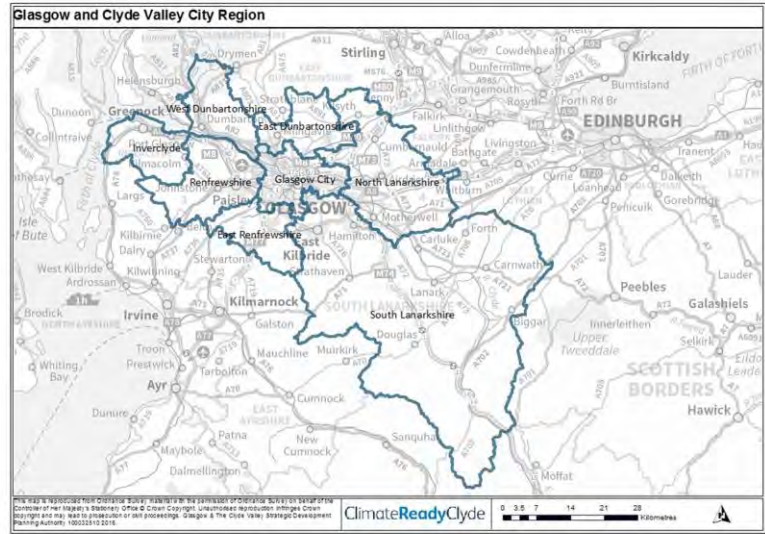


Supporting economic development through climate resilience: Glasgow City Region's adaptation approach



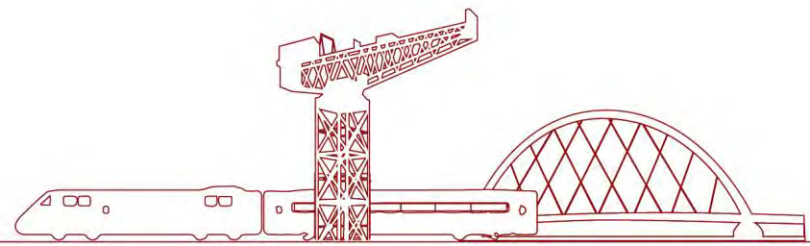
3 July 2019

- 8 municipalities within Glasgow City Region
- £40bn GVA – a third of Scotland's Economic Activity
- 1.8m people live, work and play here
- Diverse mix of urban and rural areas



Credit: University of Glasgow

Climate Ready Clyde



- Strategic initiative to support Glasgow City Region to manage the current and future impacts from the climate crisis.
- 15 partners establishing a coordinated, cross-sector long-term approach to adaptation
- Key mechanisms:
 - Development of adaptation strategy and action plan, & shared evidence base
 - Capacity building and support
 - Climate leadership and advocacy and international knowledge exchange
- Development of Adaptation Strategy and Action Plan underway – endorsed by Glasgow City Region Cabinet



Strategic framing in Glasgow City Region

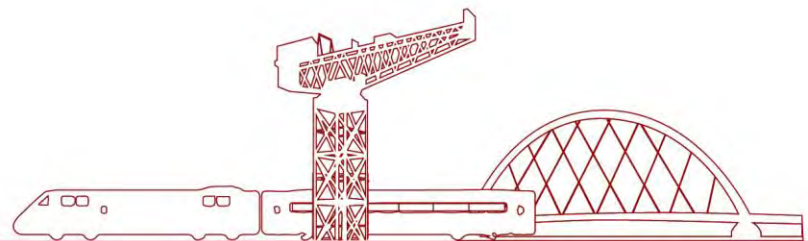
- **Supporting Inclusive Economic Growth**
 - Climate proofing support long term economic performance
 - Private sector confidence – will strengthen positions in Inward investment tracking services
 - Ensuring new capital investment achieves economic uplift for long-term
 - Done correctly, can reduce mental and physical health impacts, including disproportionate effect on most vulnerable – e.g. children, elderly, low income, renters
- **Improving attractiveness of City Region** as a place to live, work and play – enhancing our cultural heritage
- **Fiscal sustainability** – Helps avoid unforeseen costs



Our members



Scottish Government
Riaghaltas na h-Alba
gov.scot





Economic framing of adaptation in Glasgow City Region's Adaptation Strategy



Strategy focus



Short term (next 5 years)

- Address priority risks from Risk and Opportunity Assessment in a fiscally and socially responsible way

Medium term (next 10 years)

- Set the framework to build the City Region's overall resilience to projected future climate change to support economic development
- Outline the mechanisms for future delivery – funding and accountability - partnership working crucial here
- Support City Region's broader agendas around economic development

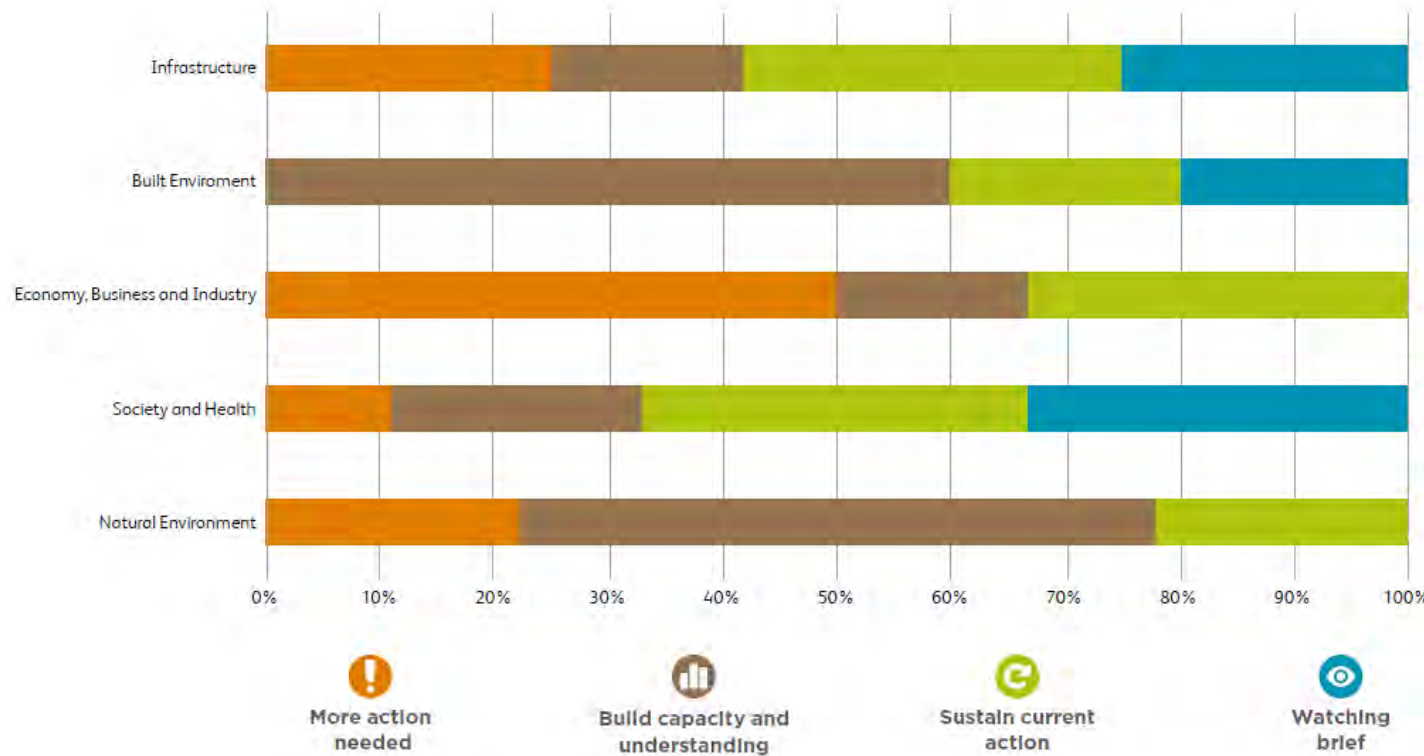
Long term (10+ years)

- Move upstream into broader socioeconomic processes which drive exposure and vulnerability



Climate risks and opportunities for GCR

For economy, business and industry, adaptation economy and tourism identified as opportunities, whilst risks to business disruption, sites, and supply chains, as well as water scarcity all identified as risks



IMPACT			BENEFIT		
N			N		
-L	Low	<£0.5 million/yr	-L	Low	<£0.5 million/yr
-M	Medium	£0.5 - 5 million/yr	+M	Medium	£0.5 - 5 million/yr
-H	High	£5 - 25 million/yr	+H	High	£5 - 25 million/yr
-VH	Very high	>£25 million/yr	+VH	Very high	>£25 million/yr

min Ext risk = Extreme event with minor impacts
Maj Ext risk = Extreme event with major (\$/HH) impacts

	CURRENT		2020s	2050s	2080s
THEME 1 - INFRASTRUCTURE					
In1: Risks of cascading failures from interdependent infrastructure networks	Uncertain	*Maj Ext risk	Uncertain		
In2: Risks to infrastructure services from river, surface water and groundwater flooding	-M	*Maj Ext risk	-M	-M	-H
In3: Risks to infrastructure services from coastal flooding and erosion	-M	*Maj Ext risk	-M	-M	-M
In4: Risks of sewer flooding due to heavy rainfall	Uncertain	*Maj Ext risk	Uncertain but potentially high		
In5: Risks to bridges and pipelines from high river flows and bank erosion	-L	*min Ext risk	-L	-L	-L
In6: Risks to transport networks from slope and embankment failure	-L	*Maj Ext risk	-L	-L	-L
In7: Risks to subterranean and surface infrastructure from subsidence	Uncertain		-L	-L	-L
In8: Risks to energy, transport and ICT infrastructure from storms and high waves	-M	*Maj Ext risk	-M	-M	-M
In9: Risks to transport, digital and energy infrastructure from extreme heat		*min Ext risk		-L	-L
In10: Risks to infrastructure from increase in vegetation growth rates/changes in growing season	-M		-M	-M	-M
In11: Risks to infrastructure from wildfires				-L	-L
In12: Risks to water-based transport and trade infrastructure (ports, canals, harbours, etc.) from SLR	Uncertain				
In13: Potential benefits to water, transport, digital, energy infrastructure from reduced extreme cold	Uncertain				
THEME 2 - BUILT ENVIRONMENT					
BE1: Risks to homes from flooding	-VH	*Maj Ext risk	-VH	-VH	-VH
BE2: Risks to building fabric from moisture, wind, storms and driving rain	-L	*Maj Ext risk	-L	-L	-L
BE3: Risks to significant heritage properties from landslides, flooding or coastal erosion	Uncertain				
BE4: Risks to traditional and historic buildings from moisture, wind and driving rain	Uncertain				
BE5: Increased maintenance of green space due to rising temperatures and severe weather	Uncertain				
BE6: Increased cooling demand in buildings as a result of rising temperatures	-L		-L	-L	-H
BE7: Risks to homes from sea level rise	captured in flooding above				
BE8: Risk of overheating of buildings from increased energy efficiency/insulation					
BE9: Potential for improved physical and mental health from increased use of parks and green space			+L	+L	+L
BE10: Opportunities for local food growing from warmer temperatures and increased growing season			+L	+L	+L
BE11: Reduced heating demand to buildings from rising temperatures	+VH		+VH	+VH	+VH
BE12: Increased viability of renewable electricity and heat from changing weather conditions			-L	-L	-L

	CURRENT		2020s	2050s	2080s
THEME 3 - COMMUNITIES AND HEALTH					
CH1: Risks to people and communities from flooding	-L		-L	-M	-M
CH2: Increase in summer temperatures and heatwaves leading to increased morbidity and mortality	-L	*Maj Ext risk	-M	-M	-M
CH3: Risks to business continuity of health and social care from extreme weather	Uncertain		Uncertain but potentially high		
CH4: Increased patient demand on NHS services from high winds, snow and ice, floods, cold weather			-L	-L	-L
CH5: Risks to the viability of coastal communities from sea level rise	partly captured in flooding				
CH6: Risks to health from changes in air quality	-L		-L	-L	-L
Risks to health from changes in air quality (aero-allergens)	Not quantified				
CH7: Risks to health from vector-borne pathogens	-L		Uncertain		
CH8: Risks to Sport and leisure activities from severe weather, higher temp and increased prec.			-L	-L	-L
CH9: Potential benefits to health and wellbeing from reduced cold			+VH	+VH	+VH
THEME 4 - NATURAL ENVIRONMENT					
NE1: Risks from changes in agricultural productivity and land suitability	Not quantified				
NE2: Risks to soils from increased seasonal aridity and wetness	Not quantified				
NE3: Risks from changes in forest productivity and land suitability	-L		-L	-L	-L
NE4: Risks to species and habitats due to inability to respond to changing climatic conditions	Not quantified				
NE5: Risks to natural carbon stores and carbon sequestration	Not quantified				
NE6: Risks to agriculture and wildlife from water scarcity and flooding	-L		-L	-L	-L
NE7: Risks to freshwater fish species from higher water temperature, phenology	Not quantified				
NE8: Risks of land management practices exacerbating flood risk	Not quantified				
NE9: Risks to agriculture, forestry, landscapes and wildlife from pests, pathogens and invasive sp	Not quantified				
NE10: Risks to agriculture, forestry, landscapes and heritage from changes in extremes, and wildlife	Not quantified				
NE11: Risks to the natural environment from sea level rise	Not quantified				
NE12: Risks and opportunities for marine species, fisheries and heritage from ocean acidification	Not quantified				
NE13: Opportunities from changes in agricultural productivity and land suitability	Not quantified				
NE14: Opportunities from changes in forest productivity and land suitability	Not quantified				
NE15: Opportunities from new species colonisations	Not quantified				
THEME 5 - BUSINESS AND INDUSTRY					
BI1: Risk to new and existing business sites from river, surface water and coastal flooding	-VH	*Maj Ext risk	-VH	-VH	-VH
BI2: Risks to business operations from water scarcity	N		N	-L	-L
BI3: Risks to business from reduced employee productivity	-L		-L	-L	-L
BI4: Risks to business from disruption to supply chains and distribution networks	Uncertain		Uncertain but potentially high		
BI5: Opportunities for products and services to support adaptation to climate change	This will be covered in the K-Matrix report				
BI6: Increased tourism revenue from increased temperatures			+L	+L	+L

Cost (or benefit) = the number of physical units in year *times* the economic unit value

Specifically:

The cost (or benefit) of a weather-related event on a specific vulnerable receptor (or group of receptors), under selected climate and socio-economic scenarios (£ per event in year *t*)

equals

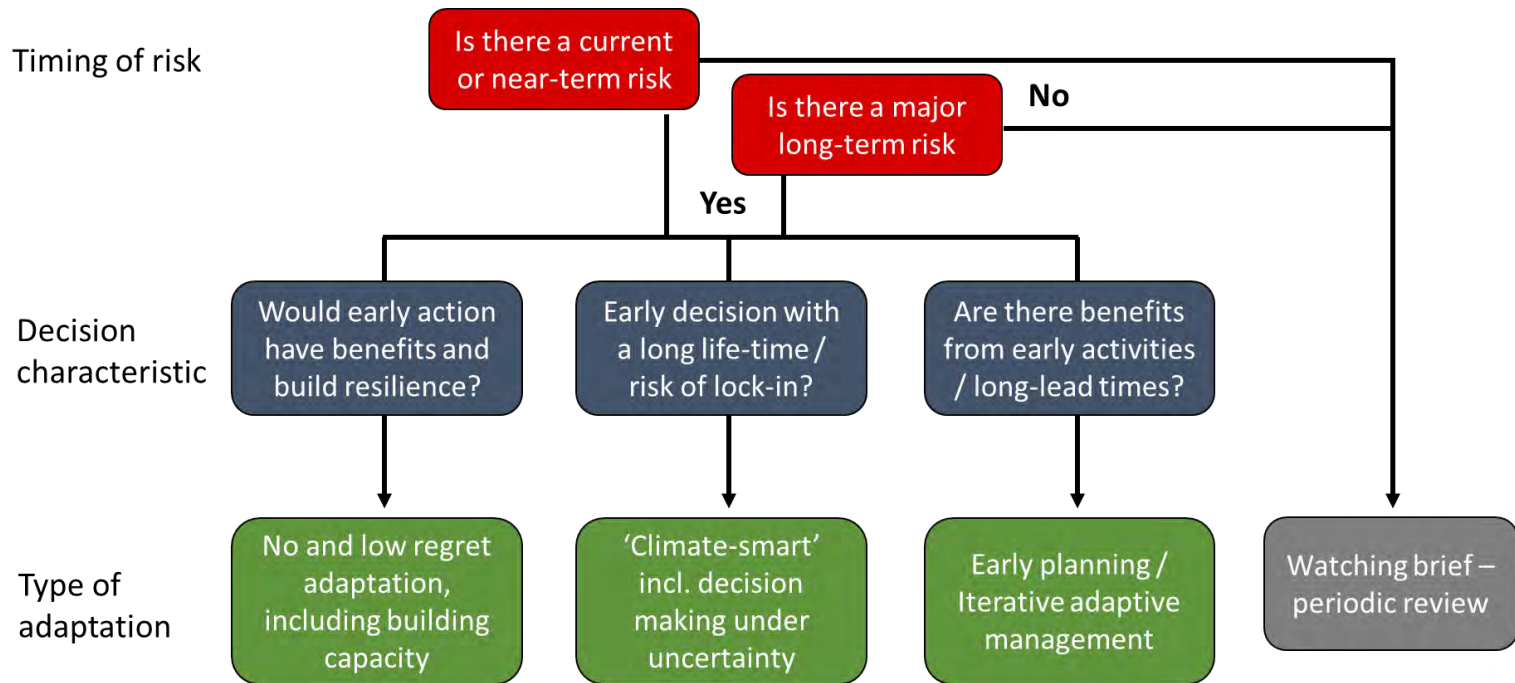
The predicted ‘physical’ impact on the vulnerable receptor(s), under selected climate and socio-economic scenarios (the number of physical units affected by the event in year *t*)

times

The appropriate economic unit value or ‘price’ (£ per affected unit in year *t*)

- Total aggregate costs £400m/year in 2050s
- Similar numbers in terms of benefits but for different groups
- Large-scale climate event would have high financial and economic impacts, as well as wider (multiplier effects) - hit the public finances

Guiding principles for prioritisation of adaptation options



Strategy focus



Short term (next 5 years)

- Address priority risks from Risk and Opportunity Assessment in a fiscally and socially responsible way

Medium term (next 10 years)

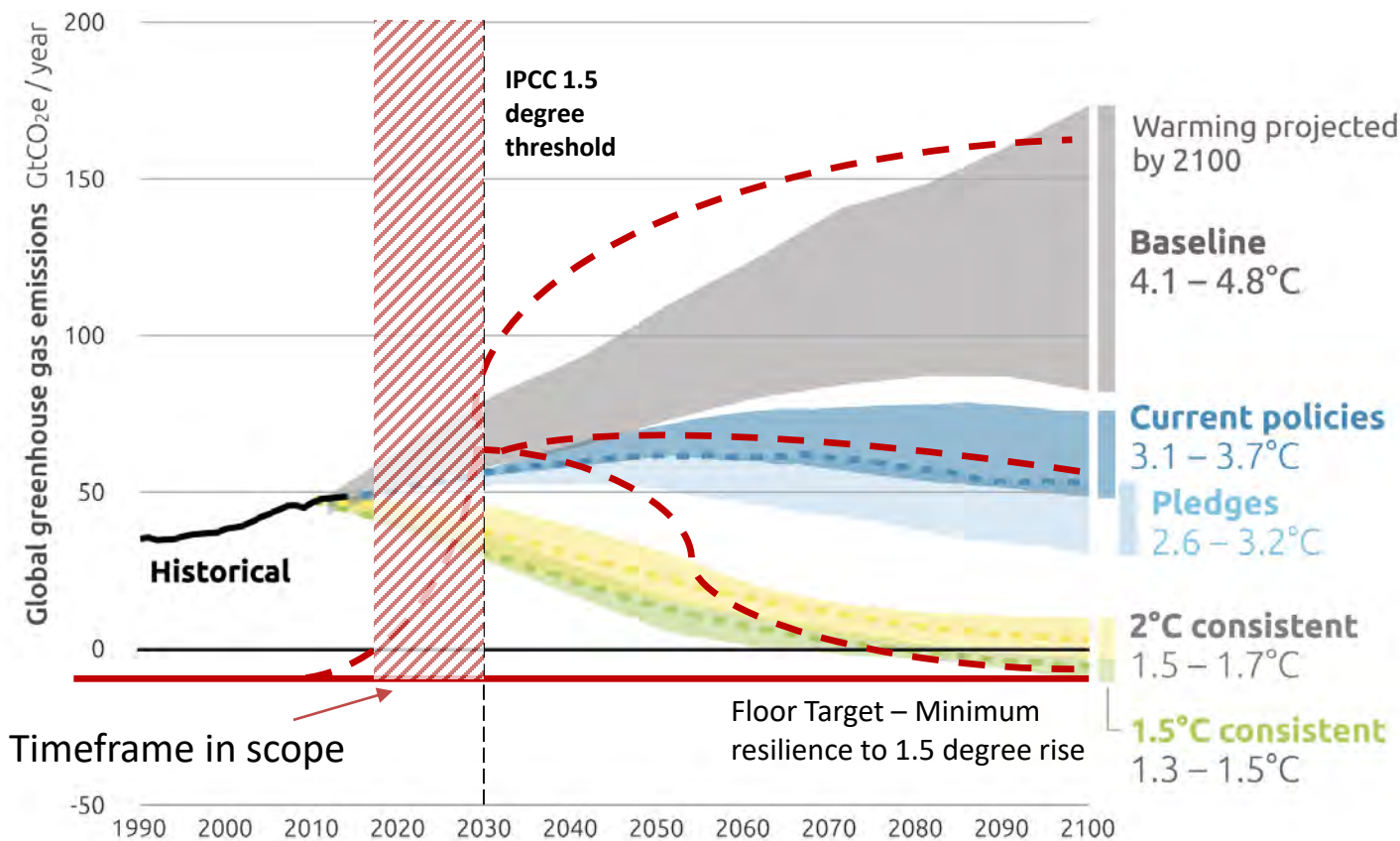
- Set the framework to build the City Region's overall resilience to projected future climate change to support economic development
- Outline the mechanisms for future delivery – funding and accountability - partnership working crucial here
- Support City Region's broader agendas around economic development

Long term (10+ years)

- Move upstream into broader socioeconomic processes which drive exposure and vulnerability



Climate resilience trajectory for Glasgow City Region



- IPCC 'gives world 11 years before pathways relatively fixed
- Range of uncertainty on climate change
- Global emissions target of 1.5 – 2 degrees
- Government's ramp up efforts every 5 years – next due in 2020
- Aim to build 4-degree capacity and resilience now – revise with mitigation progress
- Actual assumptions will vary

Emissions Data: Climate Action Tracker

Strategy focus



Short term (next 5 years)

- Address priority risks from Risk and Opportunity Assessment in a fiscally and socially responsible way

Medium term (next 10 years)

- Set the framework to build the City Region's overall resilience to projected future climate change to support economic development
- Outline the mechanisms for future delivery – funding and accountability - partnership working crucial here
- Support City Region's broader agendas around economic development

Long term (10+ years)

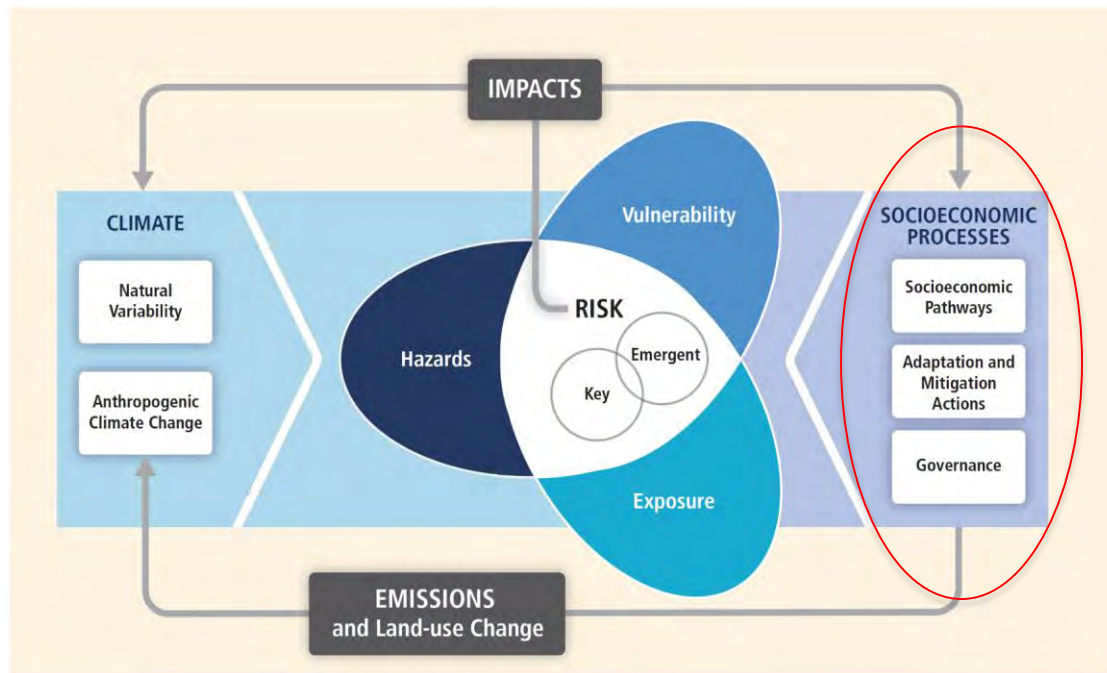
- Move upstream into broader socioeconomic processes which drive exposure and vulnerability



Moving upstream



- Short term need to recognise that climate change can protect and enhance broader economic, social and environmental goals
- Longer term need to recognise that these models are also driving our vulnerability and risks to an extent so have to explore why and how they can be addressed



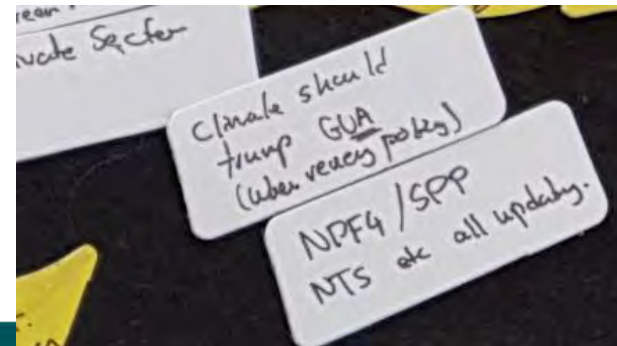
Some hard questions



- Our present neo-liberal economic model is driving uneven exposure and vulnerability to climate risk, mirroring broader inequality at global, national and local scales
- Moving upstream requires examination and readjustment of financial flows, power structures and mindset – e.g. not 100 resilient cities, but ALL
- Suggests adaptation practitioners should be shaping land-use, economic development and welfare approaches as part of broader transformation for other environmental/social progress

Systemic change:

An adaptation strategy must consider the impacts of economic status quo and whether current economics undermine the ability for adaptation to be delivered.



July 2, 2019 | London

[Contact Us](#)

Standard Rate

GBP 1,095.00

Table - 8 Seats

GBP 7,000.00

The Economist Subscriber Rate

GBP 876.00

Academic/Government/Public Sector/Charity/NGO rate

GBP 657.00

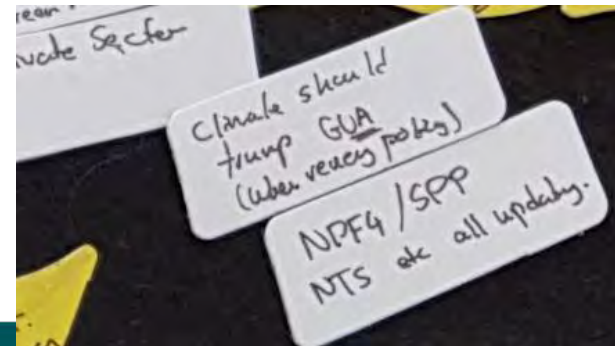
Some hard questions



- Our present neo-liberal economic model is driving uneven exposure and vulnerability to climate risk, mirroring broader inequality at global, national and local scales
- Moving upstream requires examination and readjustment of financial flows, power structures and mindset – e.g. not 100 resilient cities, but ALL
- Suggests adaptation practitioners should be shaping land-use, economic development and welfare approaches as part of broader transformation for other environmental/social progress

Systemic change:

An adaptation strategy must consider the impacts of economic status quo and whether current economics undermine the ability for adaptation to be delivered.

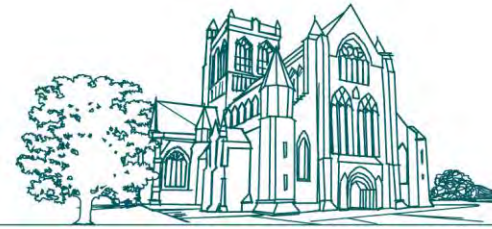




Capacity building and support for climate resilient economic development



Capacity building and support



- Development of climate risk management system for capital investment underpinning economic development
 - Embedded into draft economic development strategy
 - Development of open-source toolkit to assess infrastructure and built-environment projects and training
- Economic appraisal of costs and benefits of adaptation options for City Region
- Exploring partnerships with risk analysis firms for aligning risk disclosure with TCFD corporate requirements





Kit England

Climate Ready Clyde Manager

T: 0141 229 7738

[E: kit@sniffer.org.uk](mailto:kit@sniffer.org.uk)

@kitengland / @ClimaReadyClyde



University
of Glasgow



sustainable thriving achieving

East Dunbartonshire Council

www.eastdunbarton.gov.uk



Scottish Government
Riaghaltas na h-Alba
gov.scot



SGN
Your gas. Our network.

