Adaptive -futures

Co-creating anti-dystopian futures with GenAI

Department of Climate Change, Energy, the Environment and Water

NSW GOVERNMENT

Thanks for joining our workshop!

This AdaptNSW Climate Action Week workshop brought together diverse participants to envision climate-adaptive, thriving neighbourhoods through a co-creation approach powered by human imagination and GenAI. The session encouraged people to think beyond constraints and explore innovative, community-driven solutions for climate resilience and adaptation.

Workshop Impact

The workshop had a tangible impact on participants' perspectives and engagement with climate adaptation:

- **Optimism increased by 46%** – Participant scores on future outlook improved from 4.7 to 6.9 (on a scale of 1-10).
- **522 new ideas were generated** for future-ready, climate-adaptive communities.
- **Participants rated the workshop highly** for relevance and impact including providing new ways of understanding, articulating or approaching climate adaptation and and facing real-world challenges
- Participants expressed **a renewed sense of agency, creativity and hope** in tackling climate challenges.

Some key takeaways from the session

01

Communities need agency

People want local control of climate solutions and reduced reliance on external providers for essentials. Governments play a key role in enabling this.

02

Neighbourhoods thrive on connection

Community spaces should foster in-person connection, not just serve practical functions.

03

Multi-functionality is key

Spaces, services and products must be flexible and serve multiple purposes for climate adaptability.

04

Nature-based solutions are a priority

Urban spaces should prioritise integration of biodiversity and greenery to enhance long-term resilience.

05

Technology is an enabler, but systems must be reimagined

Many solutions already exist, but unlocking their potential requires shifting behaviours, rethinking business models & decentralising systems.

Adaptation: Our framework for design

We have used adaptation as our framework for creating preferred futures that respond to the challenges of our unpredictable future.

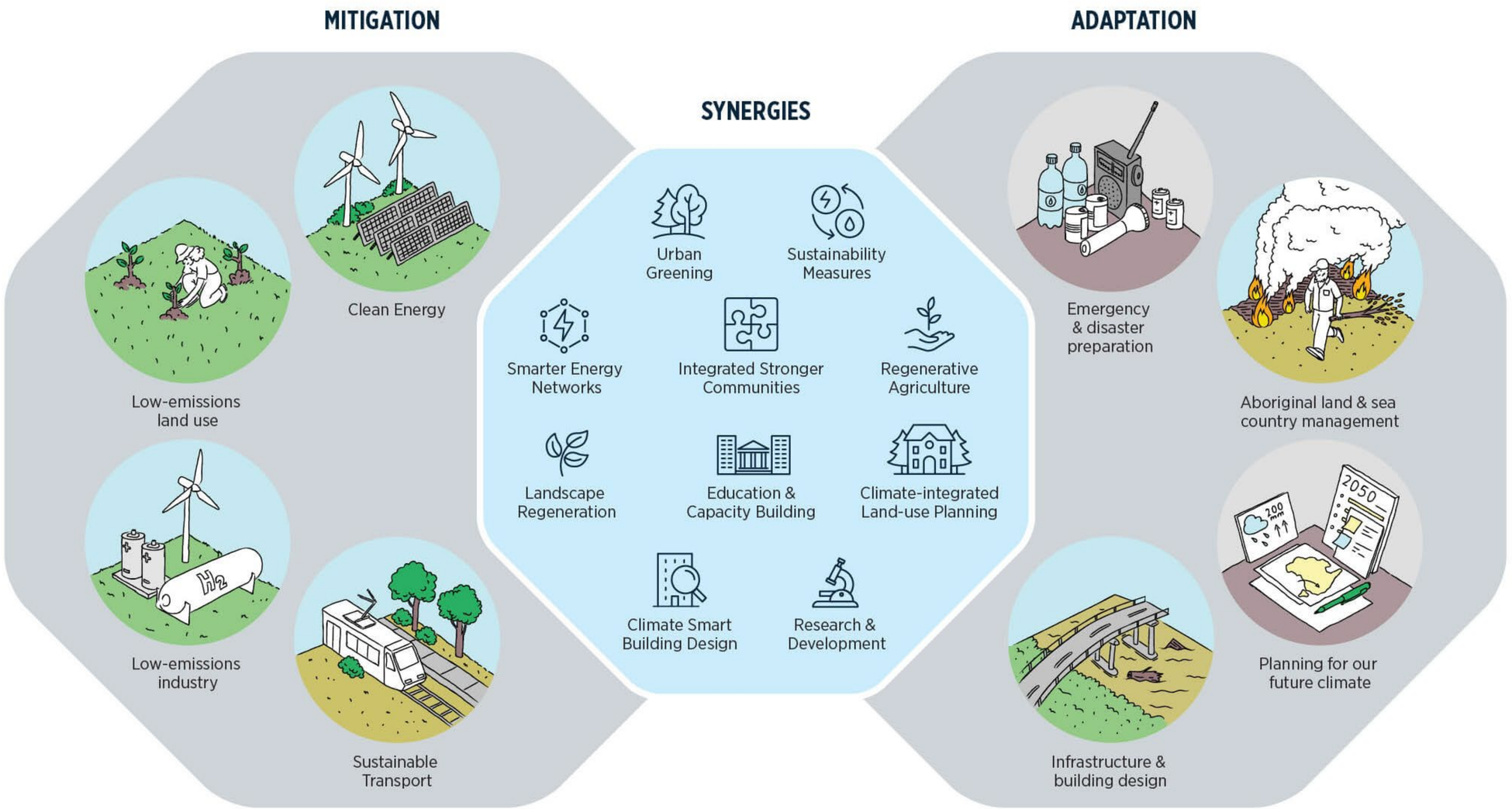
The real power of adaptation comes from its transformative potential.

By re-designing systems and integrating emissions reduction, nature and sustainability, we have the opportunity to re-imagine and collectively create the future we all deserve.

Climate change adaptation is making changes in the NOW because of how we think the FUTURE will be.

It's an acknowledgment that we can't use our records from YESTERDAY to predict what's coming because TOMORROW is going to be so different to how it is TODAY.

Mitigation vs Adaptation



Why is adaptation so critical?

The climate is changing in front of our eyes. 2024 was the hottest year on record.

Mitigation alone only deals with reducing emissions, not the consequences.

We have a duty of care to future generations to ensure a liveable future.

Climate change is already affecting natural, social and economic welfare.

Climate change will increasingly affect the environment and our quality of life.

To fail to adapt is to fail to address climate risk.

Case Study: Resilient Sydney Metro

Australia’s first mega public transport infrastructure project to offset 100% of the emissions from electricity used during operation.

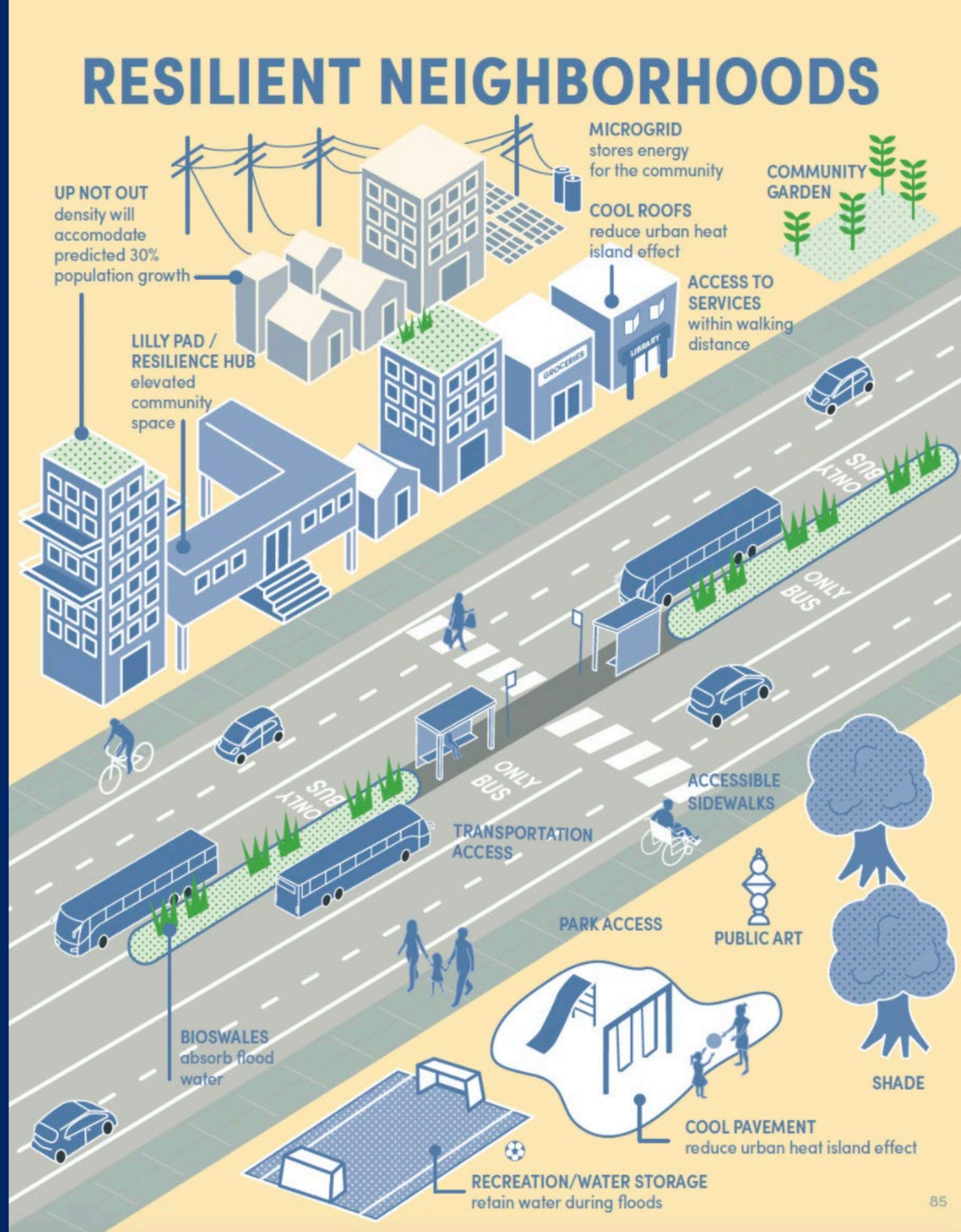
Built to last 100 years and has considered climate change adaptation every step of the way in its design.

Case Study: NYC Hunters Point South Park

A city that constructs waterfront green parks to act as a storm surge buffer, cool the city and soak up the increased rainfall and soak up carbon through the growth of the urban forest.

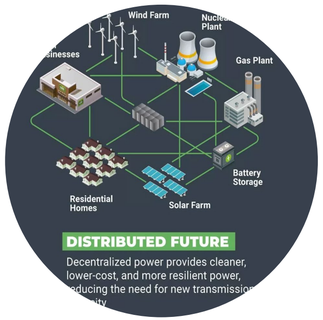
The system of a neighbourhood

- How spaces are designed & used
- How housing is built & accessed
- How people move & connect
- How resources are managed
- Where services are located
- How nature & biodiversity are integrated
- How economies & jobs are supported



What could an adapted neighbourhood look like?

Urban Permaculture & Edible Landscapes



Decentralised Renewable Energy & Microgrids

Multi-Functional Green Infrastructure

Biophilic, Resilient Architecture

Adaptive Water Mgmt & Urban Rewilding

Community-Led DIY Spaces

Reimagined Transport & Micro-Mobility

Emerging Innovation

Bioluminescent Trees

- They save energy by replacing streetlights, requiring only sunlight & CO2 to glow
- Offer backup light during blackouts & help guide people in emergencies
- Benefits of trees in cities such as cooling, shade, CO2 absorption

Sponge Cities

- Beijing is piloting a new permeable city concept
- Designed to absorb, treat and release captured rainwater to mitigate the impacts of flooding and stormwater pollution
- This is achieved via implementing a network of permeable surfaces and ‘green-blue’ infrastructure

Emerging Innovation

Personal Microclimates

- **Carlo Ratti** aims to reduce energy use with personalised heating and cooling systems that use motion sensors & infrareds
- Sustainable and responsive architecture
- Make cities more liveable, without having to waste large amounts of energy

Smart Clothing

- **Vollebak:** use science & technology to create clothes from the future using the worlds most advanced materials
- A jacket that blocks radiation & kills bacteria
- A fleece-lined hoodie that fights fire, water, wind and will last 100 yrs
- A solar charged puffer that glows in the dark, is water and wind proof

Emerging Innovation

Functional Clothing

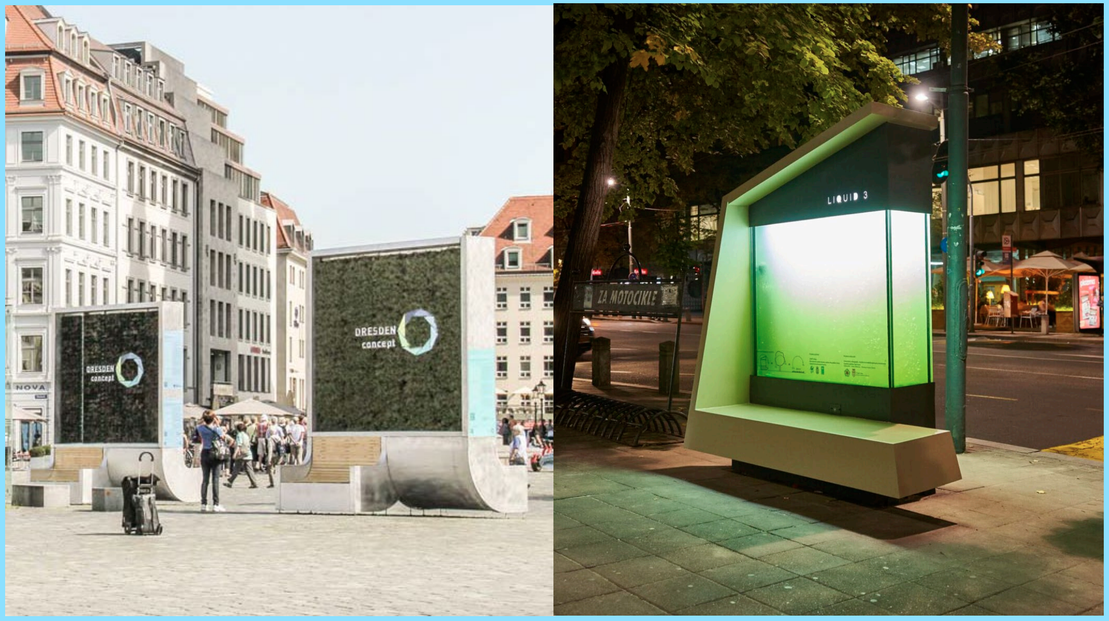
- **FogX Fog Collecting Jacket:** A jacket that catches fog & turns it into drinking water
- A wearable system that hacks into a dynamic water infrastructure – fog
- Can collect up to 10 litres of water /day
- Targets global water scarcity and privatisation of fresh water

Open-Source Farming

- **The Growroom by Ikea:** Open-Source design for an Urban Farm Pod, designed to grow enough food to feed a neighbourhood & create a shared community space
- Learn about sustainable food production and gardening
- Built with a rubber hammer, & 17 sheets of plywood, with Ikea style instructions

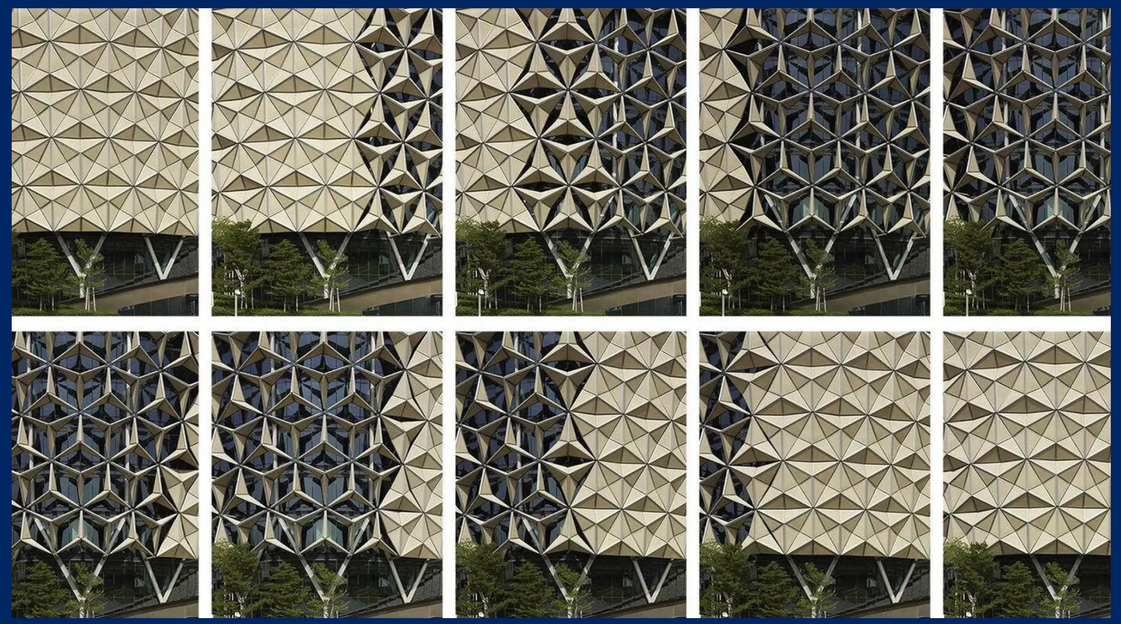
Emerging Innovation

Pollution Absorption



- **CityTree:** Intelligent biological air filter growing specially cultivated mosses to thrive in urban conditions.
- Delivers 275 times the air-cleaning capability of 1 tree
- **Liquid3:** An urban photo-bioreactor using microalgae to remove CO2, CO, PM particles, heavy metals & pollutants from the air and generates O2 and biomass

Adaptive Facades



- **Al Bahr Towers** in Abu Dhabi feature the world's largest computerised dynamic façade
- The modular shading system opens and closes like an umbrella to provide shade
- The system reduces operational carbon by decreasing its reliance on air conditioning and artificial lighting

Emerging Innovation

Multi-Purpose Spaces

- **Water Square, Rotterdam:** A public space & storm water storage combined
- A once-empty square now holds 3 large rainwater collection ponds
- When weather is dry, can be used for basketball, volleyball, skateboarding
- Stainless steel gutters channel rainwater into the ponds

Adaptive Architecture

- **Floating Above the Floods**: Innovative floating structures in Turin, Italy
- Uses kinetic architecture to create spaces that withstand the river's recurring floodings
- Example of how urban centers can develop more harmonious relationships with waterfronts

Co-creating adaptive-futures

Ideating a resilient future neighbourhood

We reimaged resilient neighbourhoods

How might we reimagine a resilient neighbourhood of the future that can adapt & thrive in a changing climate?

People & Community

Homes & Infrastructure

Products & Services

Nature & Public spaces

Asking you to ideate around these topics

01 People & Community

How might we create connected, empowered people, cultures & communities that collaborate to prepare for, and thrive, in the face of climate challenges?

02 Homes & Infrastructure

How might we design resilient, adaptable homes & infrastructure that sustain safety, comfort & essential services during changing conditions?

03 Products & Services

How might we create innovative, sustainable products & services that help us adapt to climate change while promoting resource efficiency & wellbeing?

04 Nature & Public Spaces

How might we design nature-rich public spaces that enhance climate resilience, support biodiversity & improve physical and mental health of community?

Our adaptive-future creations

A snapshot of an adaptive climate-resilient future

Summary

Together you all came up with 522 ideas across the 4 topic areas

Our collective vision for a resilient neighbourhood in 2035 that can adapt & thrive in a changing climate


SYDNEY 2035

Future Scenario

Sydney’s neighbourhoods are thriving, shaped by a mix of smart design, community-led initiatives, and nature-driven solutions. The streets hum with activity — green corridors link public spaces, creating cool, shaded walkways where people walk or cycle instead of driving. Local produce libraries dot each street, allowing neighbours to swap seasonal fruit and vegetables grown in rooftop gardens and vertical farms. Energy microgrids power homes, and shared cooling hubs provide relief from summer heatwaves. People connect through hyper-local apps that organise community-led resilience efforts, from disaster response teams to weekly “eco-heroic” school lessons.

Technology supports, rather than replaces, human connection. AI-powered neighbourhood assistants share wisdom from Indigenous knowledge, climate data, and community input to help people make informed decisions. Playgrounds generate power from movement, while bus stops filter air and double as hydration stations. Policies encourage sustainable behaviours — houses must meet passive design standards, and fast fashion is outlawed in favour of long-lasting, repairable clothing. Sydney’s transformation into a climate-adaptive, people-centred city has made life more connected, equitable, and sustainable.

CONCEPT 1

Repurposed Petrol Stations as Microgrids

Petrol stations have been converted into community-run renewable energy hubs, generating power through solar canopies, wind turbines, and kinetic tiles. These microgrids also serve as charging stations and community gathering spaces.

Visualised with Leonardo AI, March 2025

CONCEPT 2

Gamified Climate Adaptation App

A mobile app encourages neighborhoods to complete climate challenges, tracking progress and offering rewards for sustainable actions.

Visualised with Leonardo AI, March 2025

CONCEPT 3

Mend Hubs at Transport Stations

Every major transport hub in Sydney now features a "Mend Hub," a space where commuters can drop off broken items — clothing, electronics, or household goods — for repair in the morning and pick them up at the end of the day. These hubs promote circular economy principles and reduce waste.

Visualised with Leonardo AI, March 2025

CONCEPT 4

Algae-Powered Streetlights and Energy Systems

Public spaces integrate bioengineered algae that generate clean energy, lighting streets and powering small community spaces.

Visualised with Leonardo AI, March 2025

CONCEPT 5

Smart Cooling Bus Stops with Air Filtration

A network of advanced bus stops that provide clean, cool air as a byproduct of an integrated air filtration system, improving public health and comfort in extreme heat.

Visualised with Leonardo AI, March 2025

CONCEPT 6

Underground Parks for Heatwave Relief

A network of subterranean parks offers cool, shaded spaces for the community during extreme heat events, integrating natural light and air circulation systems.

Visualised with Leonardo AI, March 2025

CONCEPT 7

Clothing That Alerts Wearers to Climate Hazards

Smart clothing embedded with sensors detects extreme weather conditions and alerts wearers to risks, such as heatwaves, poor air quality, or approaching storms.

Visualised with Leonardo AI, March 2025

CONCEPT 8

Energy-Generating Playgrounds

A community park where playground equipment, such as swings and merry-go-rounds, generates electricity through kinetic movement, encouraging children to actively contribute to local energy needs.

Visualised with Leonardo AI, March 2025

CONCEPT 9

Community-Managed Microgrid & Renewable Energy Hub

Neighborhoods collectively own and manage their own renewable energy systems, such as solar microgrids, ensuring energy security and resilience.

Visualised with Leonardo AI, March 2025

CONCEPT 10

Amphibious Vehicles for Flood Resilience

A vehicle that can seamlessly transition from land to water, designed to assist residents during floods.

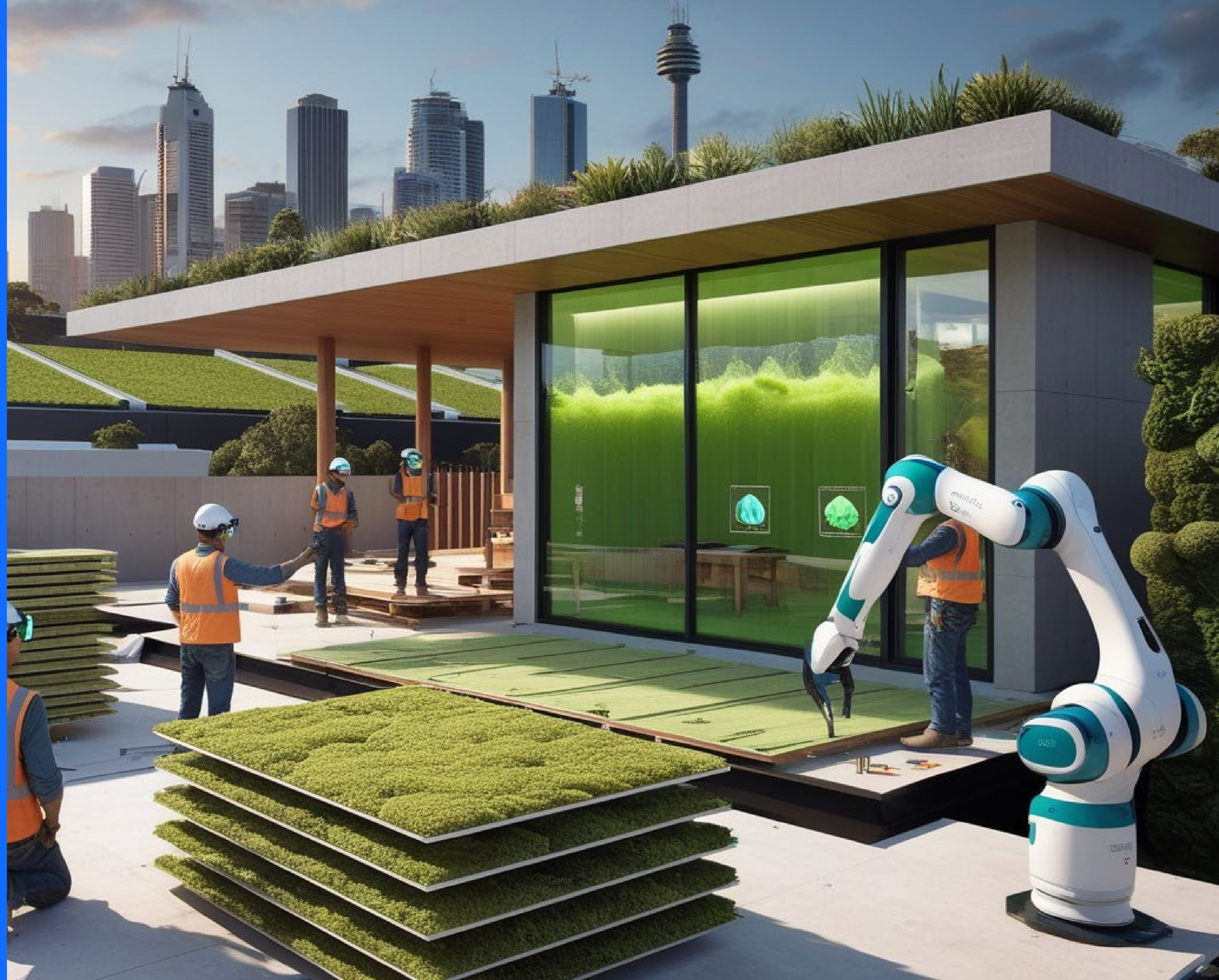
Visualised with Leonardo AI, March 2025

CONCEPT 11

Construction Company Specialising in Bio-Based Materials

A future-forward construction company using mycelium insulation, algae panels, and sustainable wood alternatives.

Visualised with Leonardo AI, March 2025



CONCEPT 12

A Futuristic School Subject: ‘Eco-Heroics’

A bold and immersive learning environment where students engage in hands-on projects about renewable energy, climate resilience, and sustainable urban design.

Visualised with Leonardo AI, March 2025

CONCEPT 13

Reimagined Coastal Defences with Oyster Reefs

Instead of concrete sea walls, Sydney’s coastline is protected by regenerative oyster reefs that provide natural storm surge protection and purify the water.

Visualised with Leonardo AI, March 2025

CONCEPT 14

Drone Swarms for Early Wildfire Detection & Suppression

Small, intelligent drone swarms detect and suppress bushfires in early stages, reducing the risk of large-scale destruction.

Visualised with Leonardo AI, March 2025

Implications & considerations for the future

New Businesses / Industries

- **Climate Missions Mobile App**
  Gamifies sustainable behaviour with community challenges and real-world rewards.
- **Neighbourhood Tool Libraries**
  Residents borrow repair tools, DIY kits, and gardening equipment instead of buying.
- **Subscription-Based Climate Retreats**
  Temporary accommodation networks for those affected by climate disasters.
- **Smart Biodiversity Monitoring Service**
  Uses AI and sensors to track species health and support urban rewilding.
- **Decentralised Energy Cooperatives**
  Community-owned microgrids that sell surplus energy locally.

Future Skills Required

- **Community Climate Adapter**
  Helps neighbourhoods organise local climate projects, microgrids, and resilience planning.
- **Urban Biodiversity Specialist**
  Designs green corridors, rooftop forests, and ecosystem-based flood protection.
- **Circular Economy Designer**
  Creates sustainable, modular products with extended producer responsibility.
- **Microgrid Optimisation Engineer**
  Manages community-based renewable energy systems for efficiency and fair distribution.
- **Eco-Narrative Educator**
  Runs workshops and school programs on climate resilience and adaptation skills.

New Policies or Regulations

- **Mandatory Passive House Standards**
  Ensures all new buildings are energy-efficient, insulated, and climate-adaptive.
- **Right-to-Repair Laws**
  Requires all products to be repairable, with standardised parts and public repair hubs.
- **Urban Rewilding Mandate**
  Public spaces must integrate native species, pollinator-friendly corridors, and tree-lined streets.
- **Fast Fashion Ban**
  Limits disposable clothing, enforcing sustainable material use and repair initiatives.
- **Neighbourhood Energy Sharing Policy**
  Legal framework for microgrids to allow community trading of excess solar power.

Unintended Consequences

- **Risk of Inequitable Access**
  Some communities may struggle to afford resilient infrastructure, widening socio-economic gaps.

- **Smart Cities and Data Tracking**
  While AI and smart sensors optimise energy use, manage microgrids, and track biodiversity, they may also enable excessive surveillance. Who controls this data, and how it’s used, could become a major concern.

- **Over-Reliance on Tech**
  AI and smart systems may reduce traditional knowledge-sharing if not balanced properly.

- **Energy Grid Fragmentation**
  Microgrids might create disparity in energy availability between connected and non-connected areas.

- **Bureaucratic Slowdown**
  Well-intended policies (e.g., building standards) could delay much-needed retrofits if not streamlined.

Thank you!

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