

Meeting the dual challenges of Covid-19 and climate change

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Introduction

- All countries around the world are now facing two major crises: the impacts of climate change and the effects of the Covid-19 pandemic
- Climate change is recognized in most countries as a phenomenon that is creating disaster on many fronts.
- The Covid-19 pandemic has been a global health, social and economic disaster. A vaccination program is not likely to be widely implemented until late 2021, and other novel viruses are also likely to emerge.

Introduction

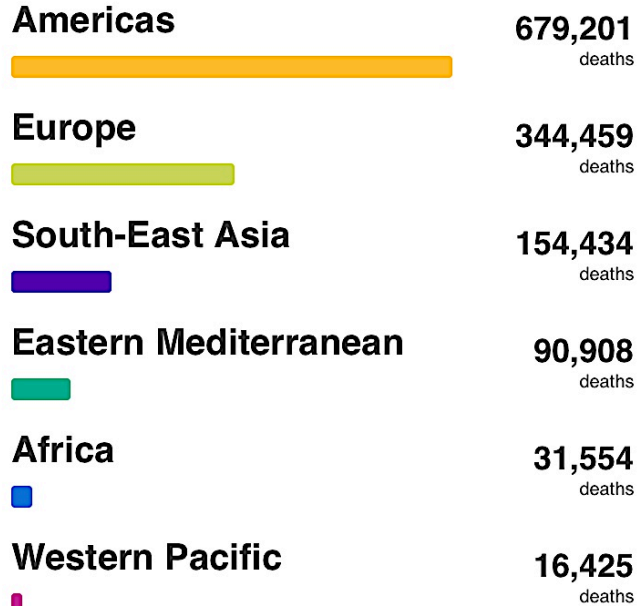
- Global economies have already been badly damaged by the pandemic, and a rebuilding program is seen by international institutions as requiring major investments.
- The massive costs of mitigation of and adaptation to climate change are becoming apparent and will rapidly mount.
- The need to address both crises offers great opportunities to integrate post-pandemic goals with those of climate action, and the next 3 to 5 years are our last chance to take strong action to deal with climate change.

The Covid-19 Pandemic

The Situation



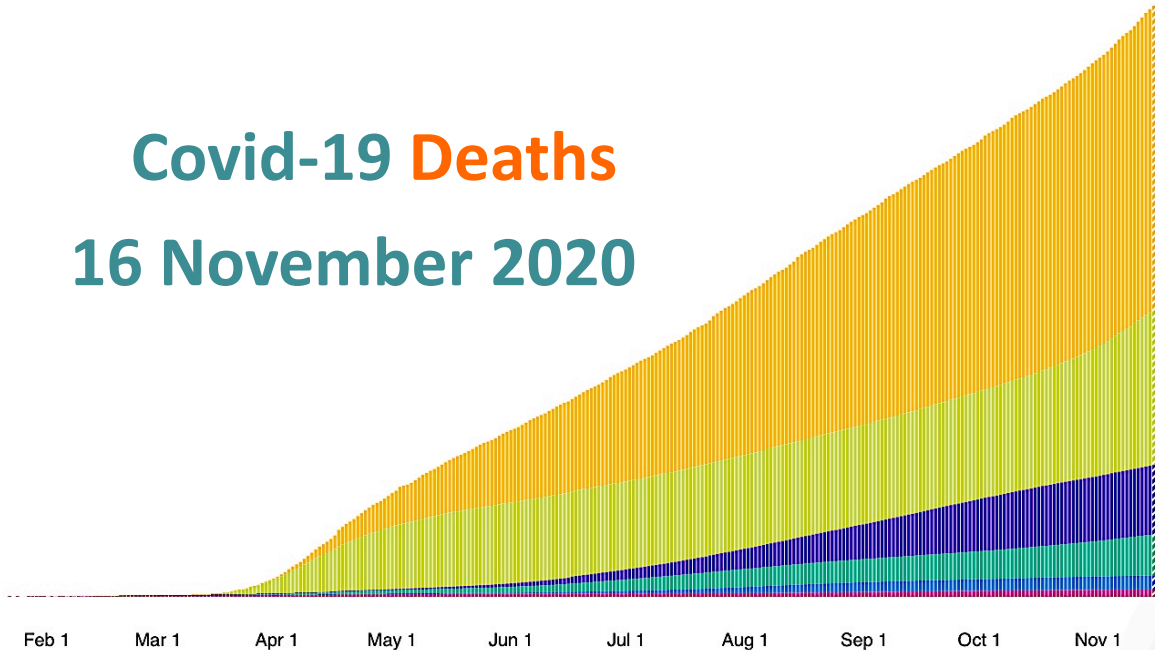
Situation by WHO Region



Source: World Health Organization
Data may be incomplete for the current day or week.

Navigation controls: Daily Weekly Cases Deaths Count

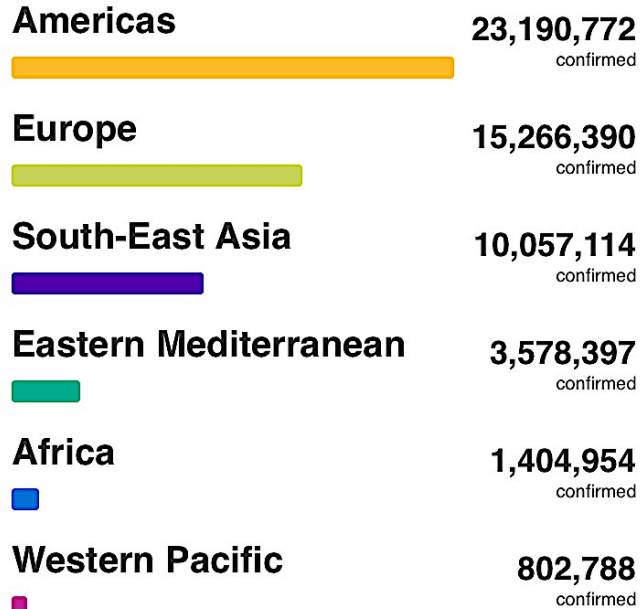
Covid-19 Deaths 16 November 2020



The Situation



Situation by WHO Region

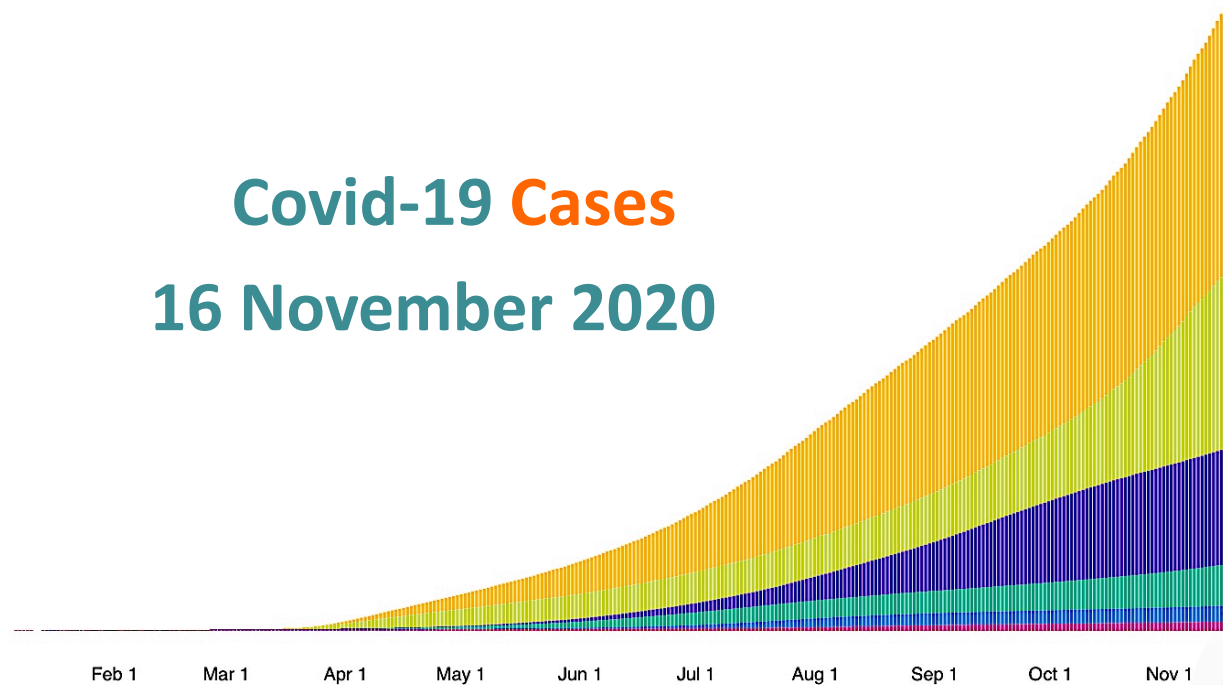


Source: World Health Organization

▨ Data may be incomplete for the current day or week.

Navigation controls: **Daily** Weekly **Cases** Deaths Count

Covid-19 Cases 16 November 2020



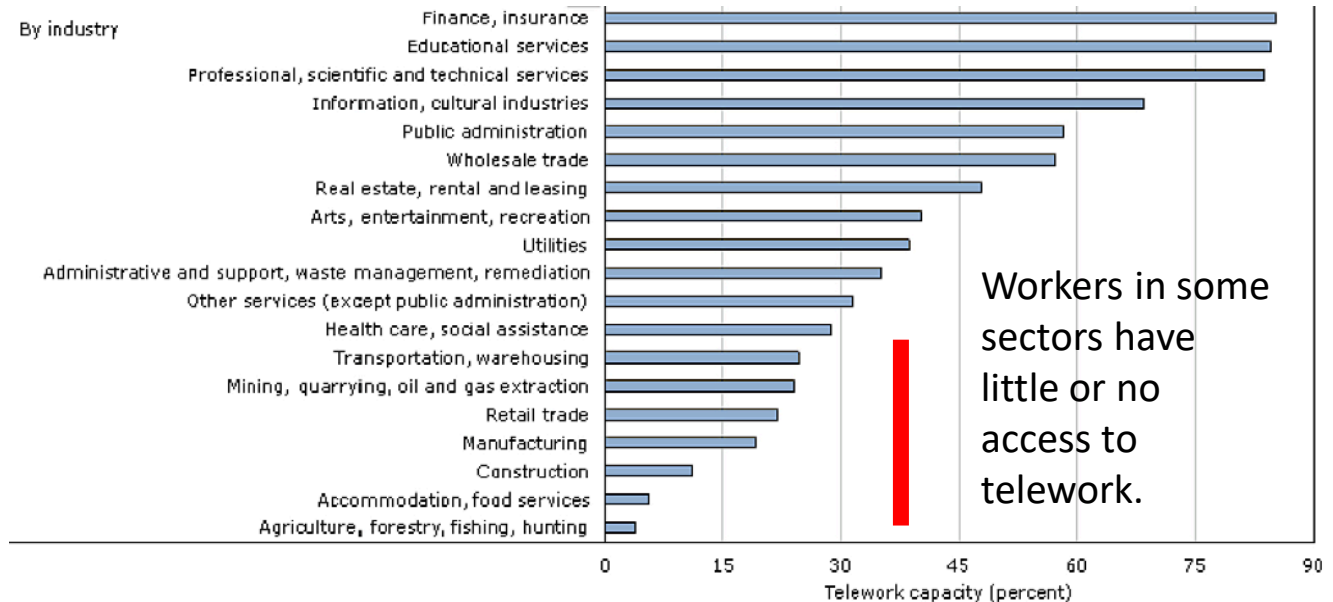
The Covid-19 Pandemic

- The Covid-19 pandemic has revealed important conflicts between pandemic health requirements and the ability to satisfy these in urban areas or buildings of various occupancy types.
- Some requirements can be met with changes in building management or with minor renovations, but others demand more substantial changes which may not be easy to implement in the short term.
- Other issues are related to the urban scale, and there are even larger questions of national governments taking up the task of post-pandemic reconstruction.

Covid-19 actions needed – policies and programs

- 1 Adapt to massive changes in work and formal education patterns that are causing an outflow of population to suburban and exurban areas.

Shifting work patterns: telework capacity by industrial sector, Canada 2019



Source: Statistics Canada, Labour Force Survey, 2019 and O*Net.

Covid-19 actions needed - policies and programs

2. Take immediate steps to rebuild the confidence of users in urban public transit systems.
3. Make use of urban areas and buildings made redundant by the pandemic:
 - a. Convert unused open parking spaces to parks, trees and open-air recreation facilities.
 - b. Convert surplus office building space to residential, educational or public uses.
 - c. Convert other surplus buildings, e.g. conference centres, gymnasias, shopping centres, parking garages or parts of airports to new uses.
4. Launch major low-income housing and commercial retail renovation programs as post-pandemic social equity and economic recovery measures.
5. Encourage natural and hybrid ventilation, Improve mechanical ventilation capacities, and increase outdoor air ratios in ventilation systems.

Covid-19 actions needed – design and construction

6. Provide all new dwelling units with private outdoor space, e.g. gardens, courts or balconies.
7. Adjust occupant densities in all non-residential buildings to support increased distancing and limits on occupant density.
8. Provide neighbourhood fever clinics and residential facilities to meet short-term isolation requirements.
9. Specify a high degree of flexibility of internal functions and systems in new residential and institutional buildings.
10. In large buildings with public access, establish building entry check points, provide scanning and monitoring of occupants' health status and movements within the building.
11. Add lift capacities to ensure reduced passenger densities.
12. Monitor wastewater flows for Covid-19 at the level of urban blocks or larger buildings.

Planning for post-pandemic recovery

A paper summarizing a survey of 231 central bank officials, finance ministry officials and other experts from G20 countries, suggests that the pandemic has *..precipitated a major increase in the role of the state... and that .. the crisis has also demonstrated that governments can intervene decisively once the scale of an emergency is clear and public support is present...**

The authors propose three key insights for policy-makers...

- Recovery policies can deliver both economic and climate goals
- Co-benefits can be captured.
- Policy design (timeliness and flexibility) is important

* Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J., and Zenghelis, D. (2020), *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?*, Smith School Working Paper 20-02.

Planning for post-pandemic recovery

Views of IEA and IMF on a sustainable recovery

- A report prepared by the International Energy Agency (IEA) and the International Monetary Fund (IMF) outlines their views on the prospects for an economic recovery.
- Regarding buildings...*More than 25 million jobs across the sector have been lost or are at risk in 2020. However, measures to improve the efficiency of buildings and appliances could be implemented quickly, in some cases with very short payback periods, creating 10-15 jobs per million dollars invested.*
- *Average annual energy retrofit rates in buildings are currently less than 1% in most major markets, which is well below the level required to achieve sustainability objectives.*

Planning for post-pandemic recovery

Views of IEA and IMF on a sustainable recovery

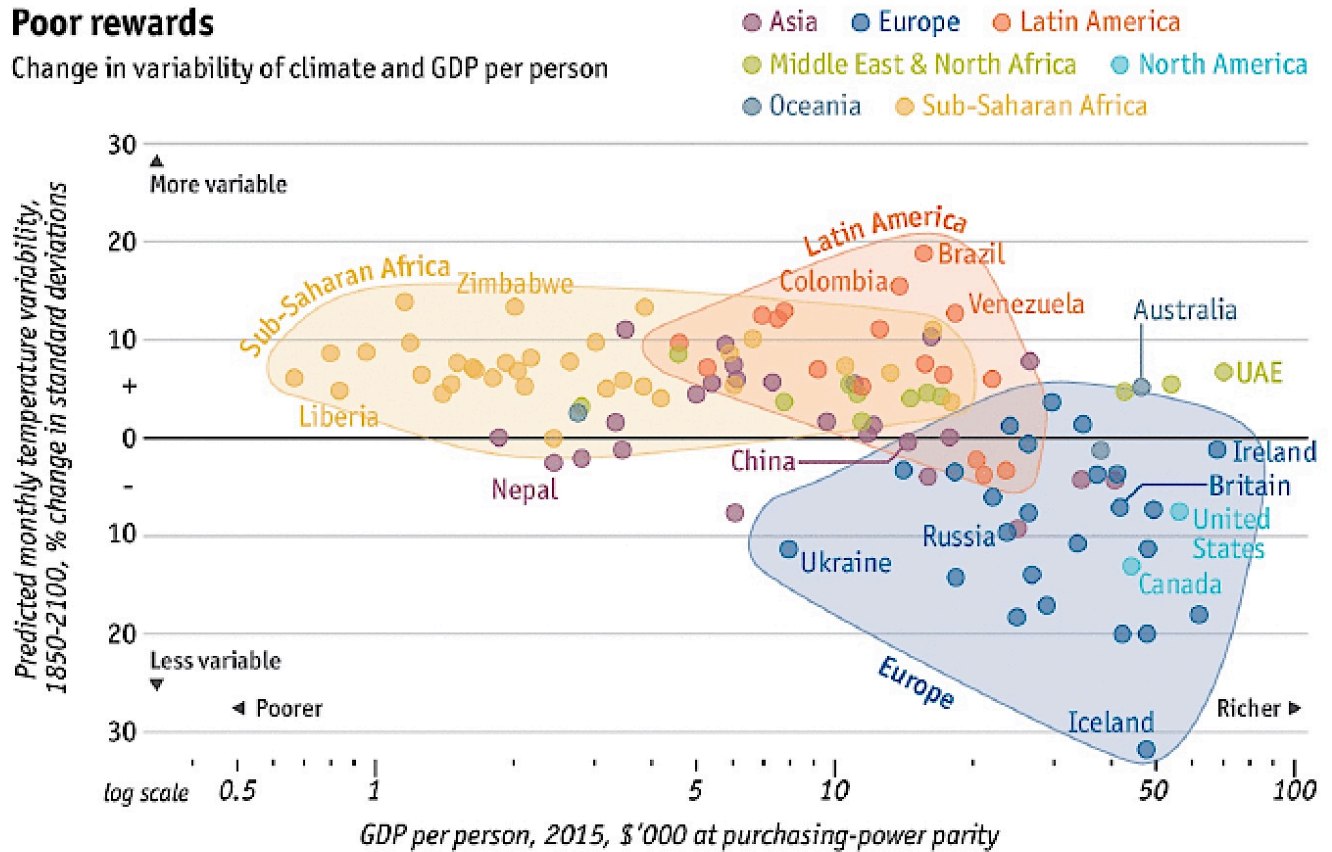
- *Suggested policy approaches to address the current Covid-19 crisis... include:*
 - *Target efficiency improvement measures on ... low-income households, small businesses and hotels.*
 - *Use public procurement to catalyse activity, for example by commissioning efficiency retrofits of public assets such as social housing, schools, offices and healthcare facilities.*
 - *Provide guarantees to encourage energy service companies to invest in retrofits.*
 - *Accelerate or expand existing and planned efficiency programmes.*

Climate Action

Climate in developing countries will become far more variable

Poor rewards

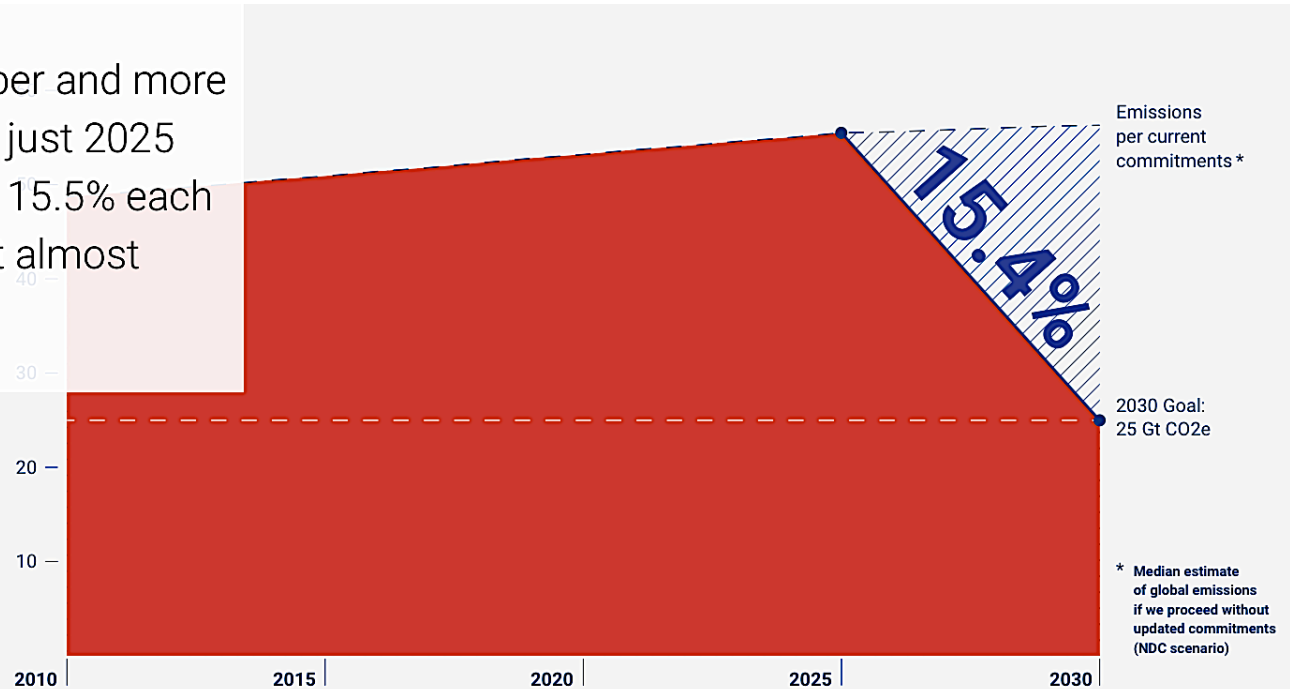
Change in variability of climate and GDP per person



Source: "Climate models predict increasing temperature variability in poor countries", by Sebastian Bathiany, Vasilis Dakos, Marten Scheffer and Timothy M. Lenton, *Science Advances*, May 2018

Annual emission reductions needed by **2025** for a 1.5°C maximum rise

Every day we delay, the steeper and more difficult the cuts become. By just 2025 the cut needed would will be 15.5% each year, making the 1.5°C target almost impossible.



Proposed key climate actions

Based on current trends and climate change impacts to date, the following actions are needed if we are to minimize any increase in ambient temperatures above 1.5°C.

1. Protect critical facilities and infrastructure (urban transport, emergency services, hospitals etc.) from climate change impacts.
2. Establish multi-stakeholder climate action authorities at national and local levels to establish relevant guidelines and to provide loans and grants for high-performance retrofits.
3. Support a shift from private to public transport.

Proposed key climate actions

4. Establish neighbourhood action strategies and performance targets.
5. Adjust VAT rates to provide incentives for renovation and disincentives for new construction
6. Freeze new construction in high-risk areas and limit new development in other areas
7. Launch deep green renovation programs to ensure high performance and low GHG emissions
8. Climate action items 8 to 18 – see full presentation.

Proposed key climate actions

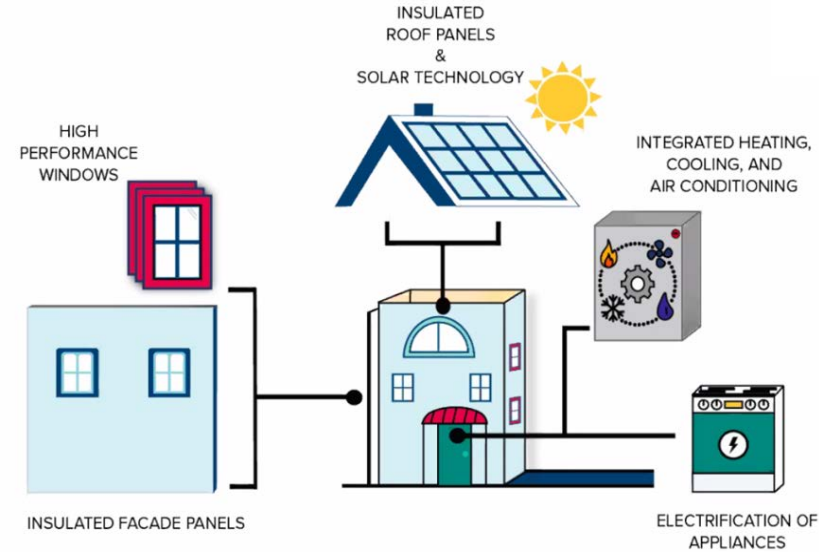
8. Introduce incentives to move rapidly towards zero use of fossil fuels and to promote clean energy and renewables.
9. Mitigate urban heat island effect by increasing areas of parks and urban forests.
10. Encourage urban agriculture for local residents to reduce transport emissions and to increase neighbourhood access to fresh produce.
11. Provide short-term housing for population groups relocated by climate change impacts.
12. Establish refuge centres in low-income neighbourhoods for use during climate emergencies.

Other proposed climate actions

13. Develop thermal-solar-greywater system synergies in groups of buildings.
14. Limit peak electrical demand to minimize need for new generating capacity.
15. Minimize embodied energy and lifecycle emissions in new construction.
16. Ensure very high operating efficiencies of new buildings.
17. Strengthen equipment and appliance efficiencies.
18. Establish public building performance databases so that we can measure progress.

Comprehensive (Deep) Building Retrofit- Decarbonization

1. Collect performance data
2. Low-cost, No-cost Measures (i.e. lighting, plugs, smart controls)
3. Occupants' Engagement
4. Green Lease Clauses
5. Energy Audit
6. Recommission HVAC Plant
7. Capital Measures i.e. Retrofit Envelope, HVAC Plant, Renewables
8. Other sustainability measures (i.e. green roof, water recycling, etc.)
9. Electric storage, car charging
10. Covid 19 response, i.e. touchless access, ventilation, density monitoring, etc.



Response to COVID 19 & Climate Change

Jiri Skopek

Biophilic Cities & Healthy



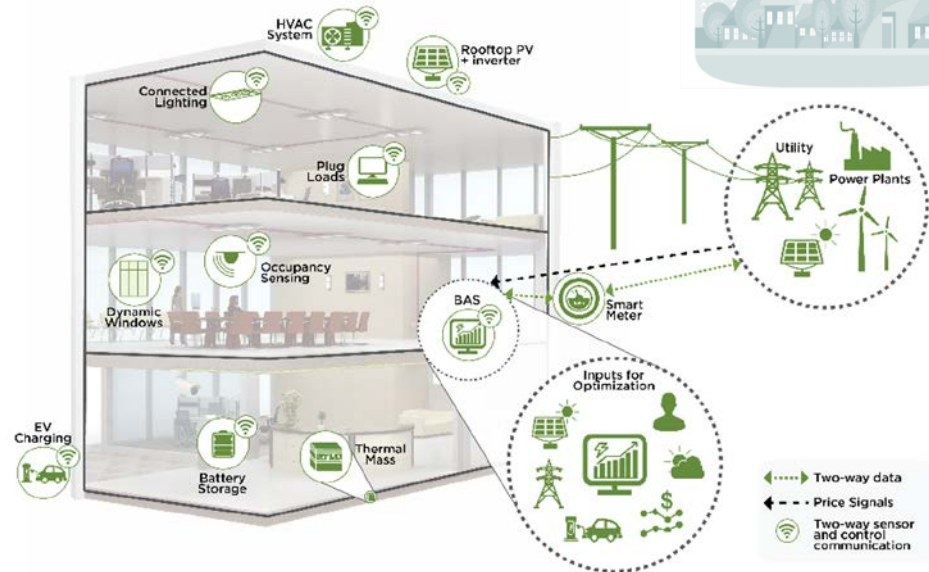
Rapid Transport Infrastructure



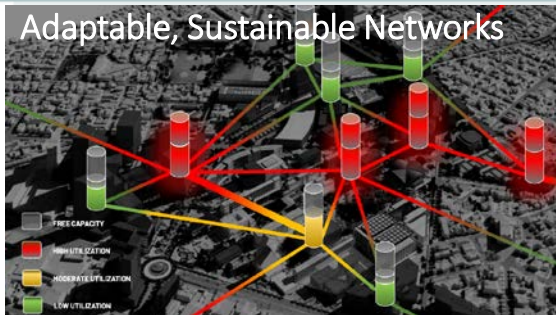
Mixed-used & mixed-income
Compact Development



Grid-interactive
Buildings & Communities



Adaptable, Sustainable Networks



Integrated action

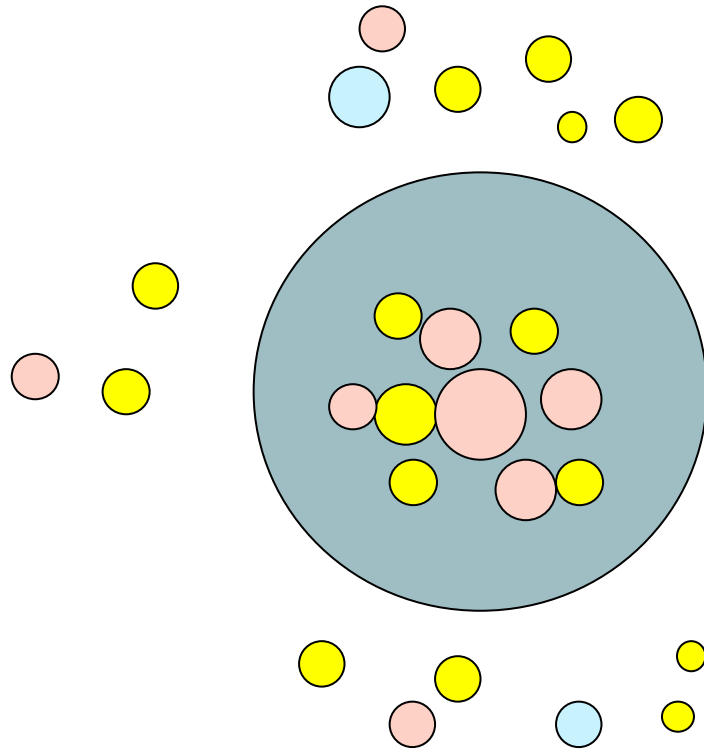
Our proposals for integrated actions

A logical action plan to respect the needs of **both post-pandemic recovery and climate action** will include the following measures:

1. Designate post-pandemic re-development authorities at national and local levels to establish or modify relevant regulations and to provide loans and grants for redevelopment.
2. Obtain major funding commitments from international financial institutions, including World Bank and IMF, and identify major private sources of capital.

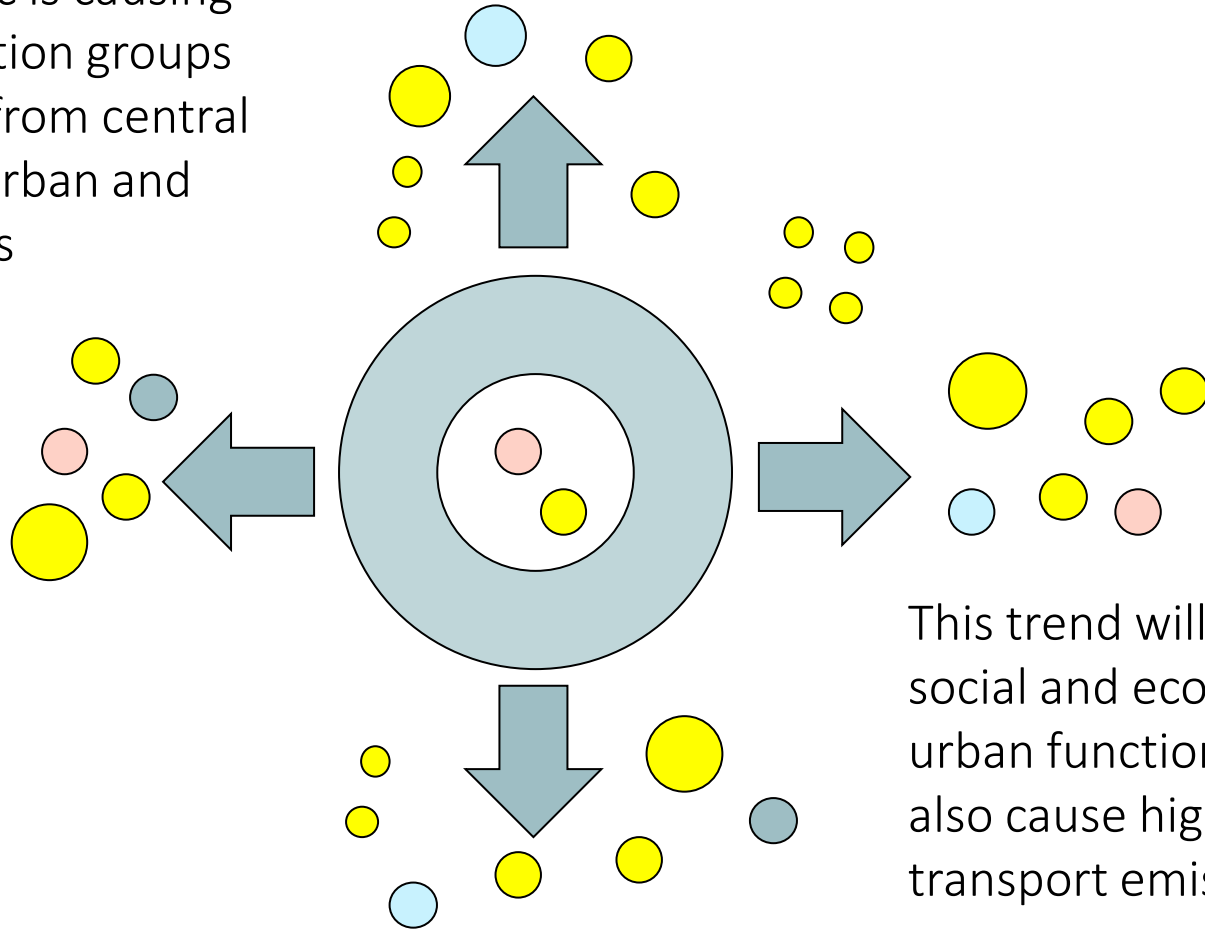
Our proposals for integrated actions

3. Integrate climate and post-pandemic actions so that post-pandemic social and economic goals and 2050 zero GHG targets can be met.
4. To take into account the current trend for some population groups to move out to peripheral areas, develop urban planning strategies that include development of high-density mixed-use urban nodes around the urban core connected by public transit.

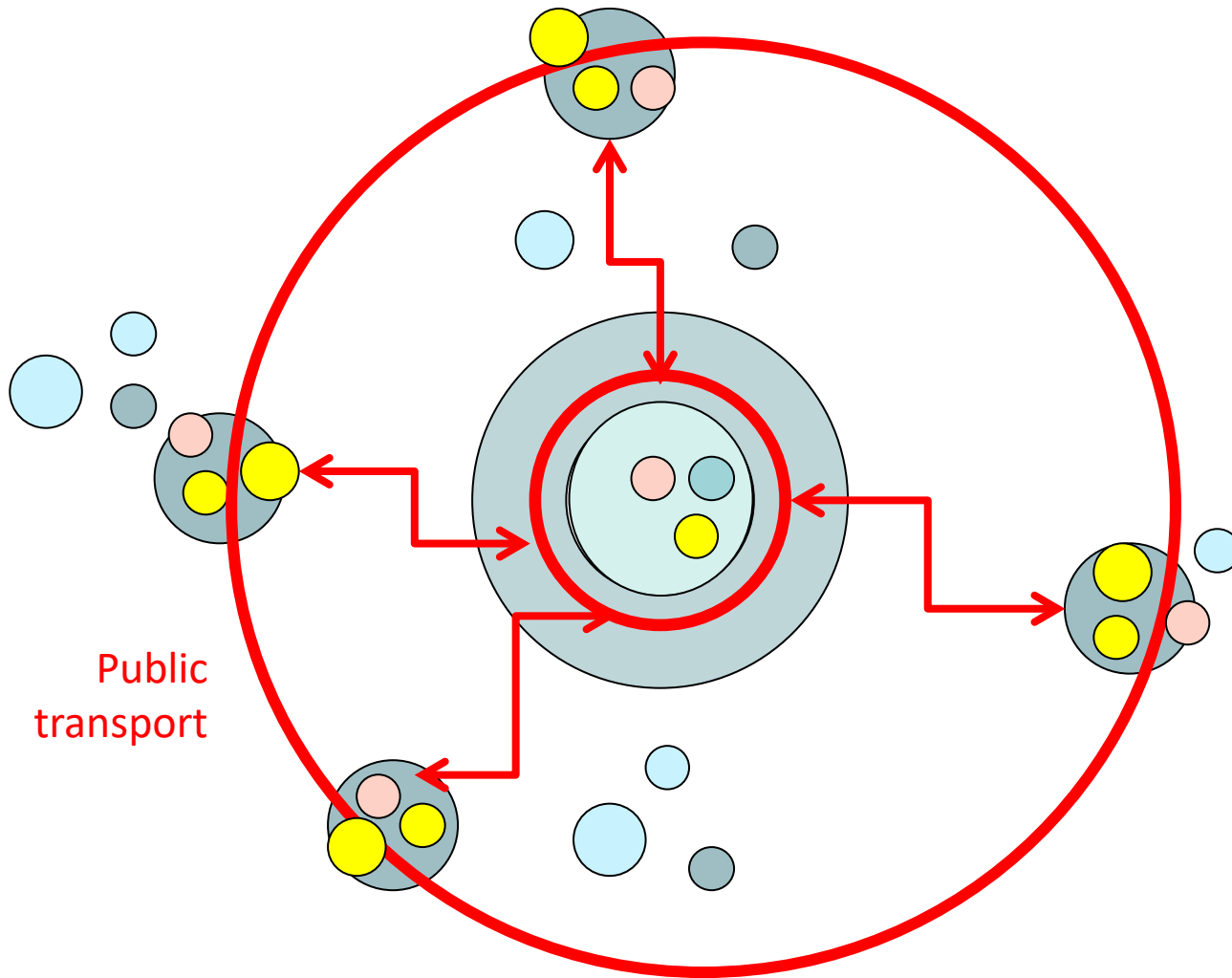


Existing patterns of high densities and mixed uses in urban centres are facing new pressures

The pandemic is causing some population groups to move out from central areas to suburban and exurban areas



This trend will cripple social and economic urban functions and will also cause higher transport emissions



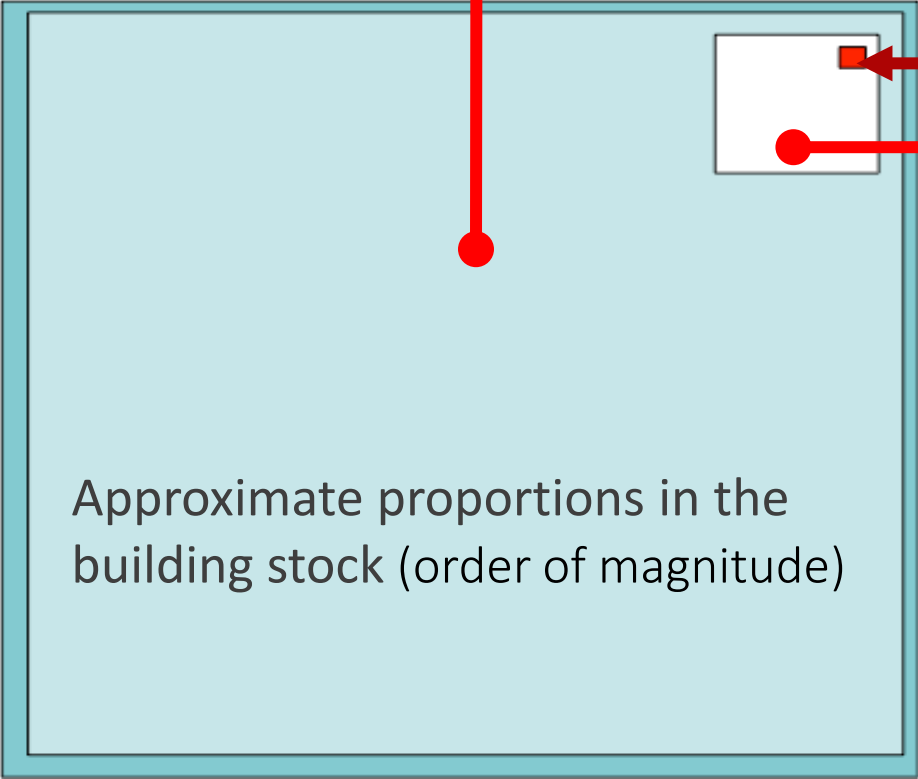
We would serve climate as well as pandemic needs if we aim for high-density mixed-use nodes connected by public transport: an old but good idea.

Our proposals for integrated actions

5. Launch housing programs for low-income populations as a major element of post-pandemic social equity and economic recovery measures.
6. For the above work, make use of buildings or parts of buildings that are now surplus to requirements.
7. Establish very demanding targets for energy efficiency and nearly-zero GHG emission buildings and urban public transport systems.
8. Reduce VAT levels for expenditures related to high-performance renovation work, to shift construction activity towards renovation.

Total building stock

Existing buildings (95% to 97%)



Certified buildings

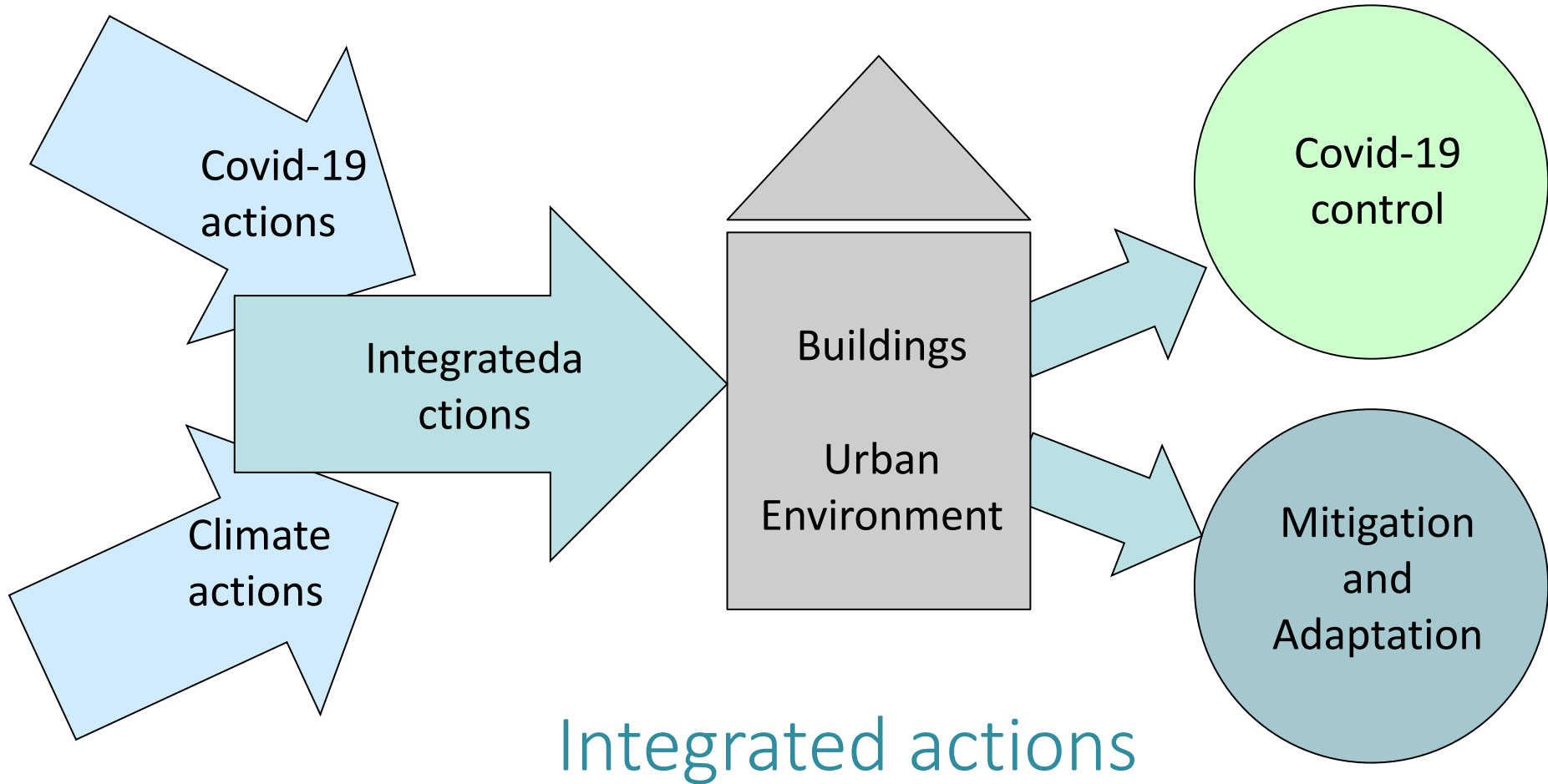
New buildings

Approximate proportions in the building stock (order of magnitude)

To reduce emissions related to the building stock, we must focus on improving the energy performance of existing buildings

Our proposals for integrated actions

9. Place heavy emphasis on renovation with high performance targets for infrastructure, residential, public and commercial retail buildings.
10. Encourage natural and hybrid ventilation, improve mechanical ventilation capacities, and increase outdoor air ratios in ventilation systems.
11. Establish training programs to support the above initiatives.



Covid-19 actions

Climate actions

Integrated actions

Buildings

Urban Environment

Covid-19 control

Mitigation and Adaptation

Integrated actions

Conclusions

- An effort to simultaneously deal with climate action issues and post-Covid needs appears to be feasible.
- Such efforts will offer great opportunities to integrate post-pandemic goals with those of climate action.

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