

# Analysing sustainable pathways and carbon reduction trajectories based on SSPs in Los Angeles to achieve a carbon neutral and sustainable city (Phase 1: SSP narratives)

Miho Kamei

Institute for Global Environmental Strategies (IGES), Japan

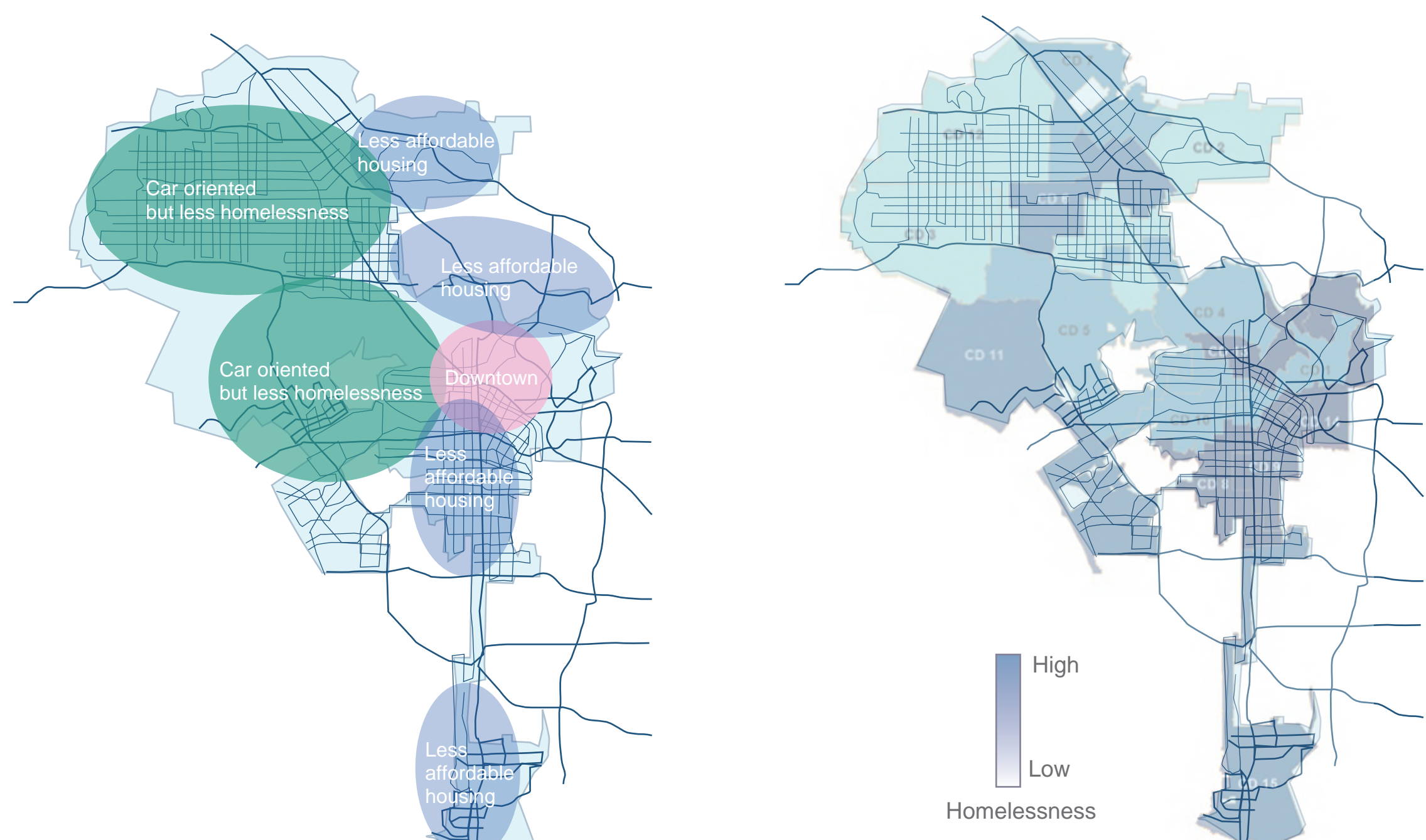
## Background

Under the Paris Agreement, which was adopted in 2015, Los Angeles has been strongly motivated to be a global leader by creating an achievable climate action plan and sustainable solutions. To meet its goals, the city has developed L.A.'s Green New Deal, which is an expanded version of the first Sustainable City pLAN developed in 2015. This Green New Deal calls for a carbon neutral city by 2050, which is an ambitious target considering current carbon emissions in Los Angeles. To realistically achieve this target, Los Angeles has to develop innovative pathways to dramatically reduce its emissions that align with creating a sufficient green economy and lifestyle transitions. Therefore, this study investigates possible pathways and carbon reduction trajectories in key sectors linked with concrete, sustainable solutions.

## Phase 1 : Development of SSP for Los Angeles (results)

**SSP2 : BAU, Carbon Lock-in & Disparity L.A.**

**SSP1 : Carbon neutral, Sustainability Super Star L.A.**

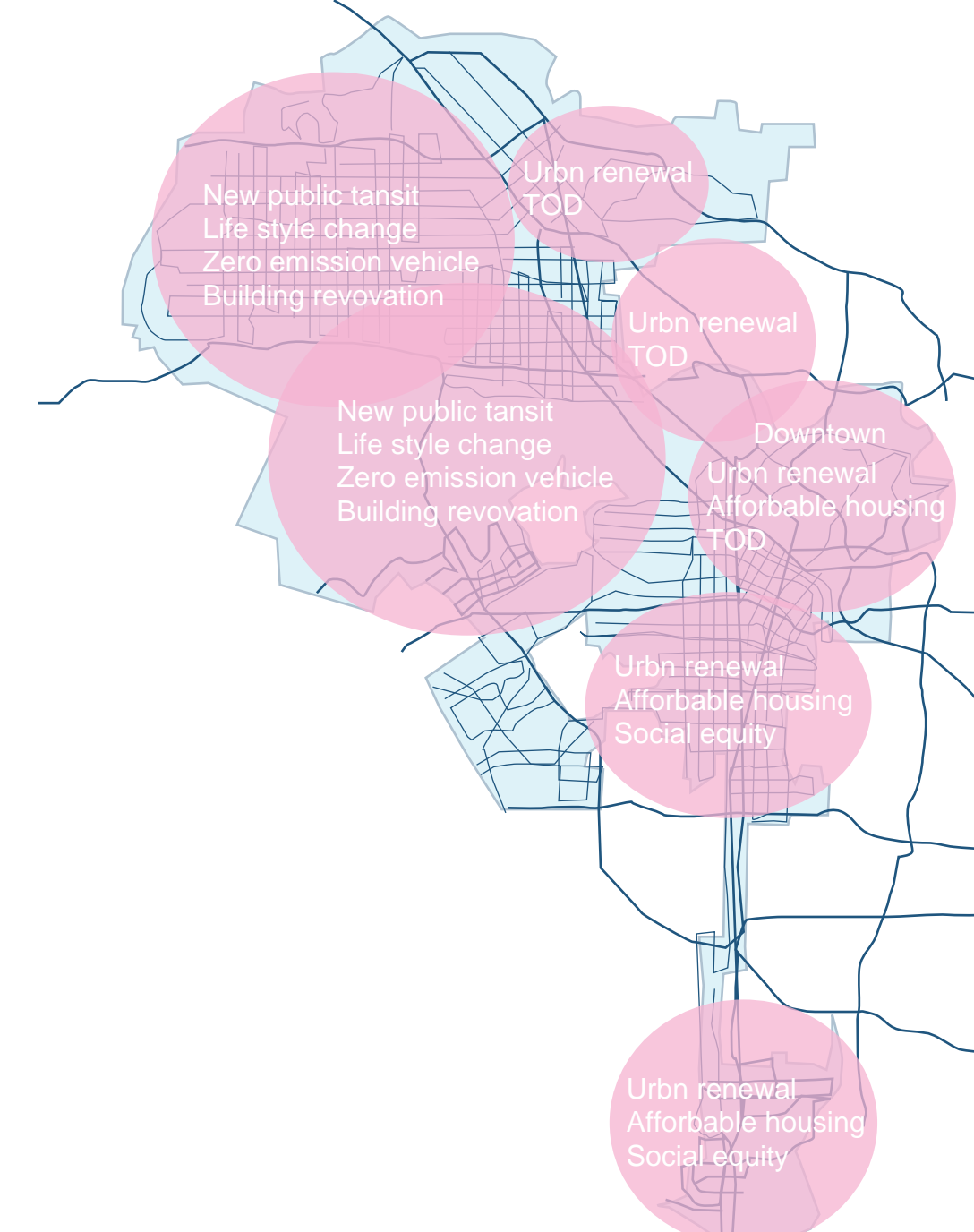


### Socio-economic Factor

Los Angeles has set many ambitious targets for sustainable growth and the green economy. However, the city's lack of relevant policy actions and financial mechanisms has resulted in a significant delay in the implementation of these targets. As long as the city's current industrial structure and fossil-fuel-based energy supply continue, green economic innovations will be unable to occur. Population growth is projected to remain stable at 0.26% per year—the same as in recent decades—through 2050. As long as these plans are not implemented, the social disparity between wealthy and poor households will only increase. Homelessness will also increase, as the city cannot afford to provide more affordable housing for low-income residents. The city's failures in sustainable planning will also lead to declines in quality of life and a lack of sufficient access to public transit. Because the city currently lacks sufficient public open spaces and green roads, it cannot promote walking and cycling. These insufficient social circumstances only serve to further increase traffic congestion and crime.

### Climate actions and SDGs

Due to the lack of climate-related policy implementations, environmental pollution has not decreased, and carbon emissions are staying at recent levels. Due to the city's lack of policy actions, its citizens do not have greater awareness of the problem and are not willing to change their behaviours or lifestyles. Even though the city has introduced innovative technologies such as zero-emission vehicles, this has not attracted consumers and has not made the market any more efficient. The city's delayed climate action has also causes delays in the development of sustainable infrastructure and renovations, which has thus led to further social disparities due to the segregation of low-income citizens—who are the most affected by climate change. Without relevant policy actions, Los Angeles cannot truly realise any of its SDGs.



### Socio-economic Factor

The Green New Deal could be implemented in an effective and timely manner in Los Angeles. The promotion of renewable energy could increase job creation and lead to new investments that advance the green economy. Owing to this, Los Angeles will be able to increase its population by 0.3% per year through 2050 and remain stable. It should also be able to increase the available housing supply to meet the demand for affordable low- and medium-income housing. Some new areas are planned in transit and mixed-use developments so as to reduce daily car use. The city will also provide solar and electric car sharing to reduce the energy burden for low-income households. Environmental justice can be truly fair, thus increasing prosperity and eliminating homelessness in the city so that all neighbourhoods have the same level of amenities and services. Increasing both public-transit access and water-quality management can dramatically improve the city's air and water quality. With this transition, including the renovation of urban infrastructures, disaster risks can also be properly managed, and climate-adaptation strategies can be effectively implemented.

### Climate actions and SDGs

Successfully installing 100% renewable energy would help the city to reduce its GHG emissions by more than 85%. In addition, a new investment of \$8 billion to upgrade the city's power infrastructure would create many new green jobs. Green New Deal projects will also include installing solar panels at no cost to help low-income families; this will increase overall energy efficiency, social equity, and well-being. All buildings can also be upgraded with passive designs that meet energy-efficiency standards. In addition, all neighbourhoods can be given sufficient access to public transit (i.e., within a walkable distance), and all vehicles can be replaced with zero-emissions vehicle. These strategies will lead to balanced sustainable development and help the city to meet its overall SDGs.



## Comparison : SSPs Los Angeles vs SSPs Tokyo

### SSPs L.A.

Los Angeles County  
12,319 km<sup>2</sup>  
9,818,605 (pop)

Los Angeles City  
1,301 km<sup>2</sup>  
3,792,621 (pop)

### SSP1 Sustainability Super Star L.A.

### SSP2 Carbon Lock-in & Disparity L.A.

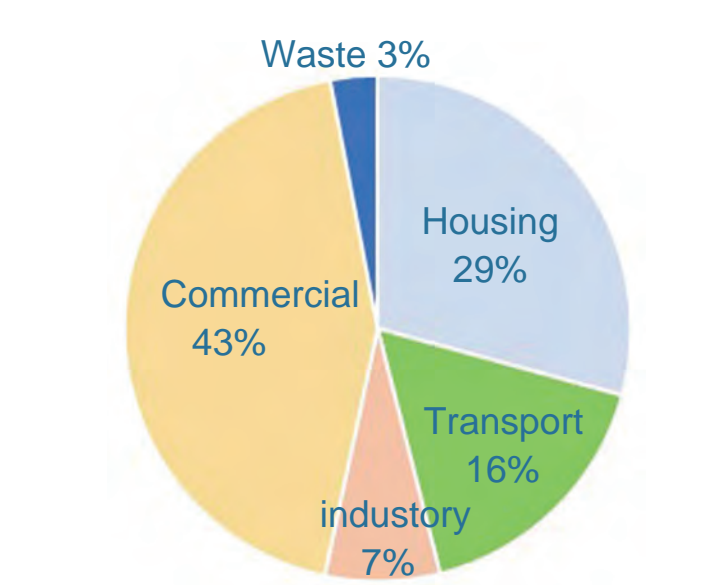
### SSPs Tokyo

Tokyo Mega-region  
14,030 km<sup>2</sup>  
38,140,000 (pop)

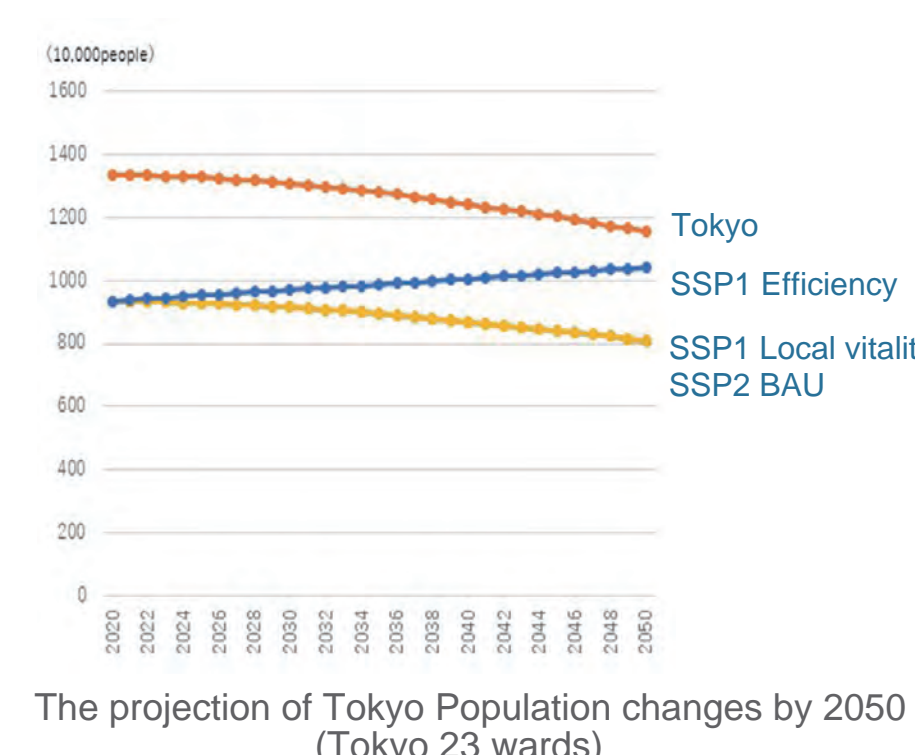
Tokyo Metropolis  
2,193 km<sup>2</sup>  
13,942,000 (pop)

### SSP1 Sustainability

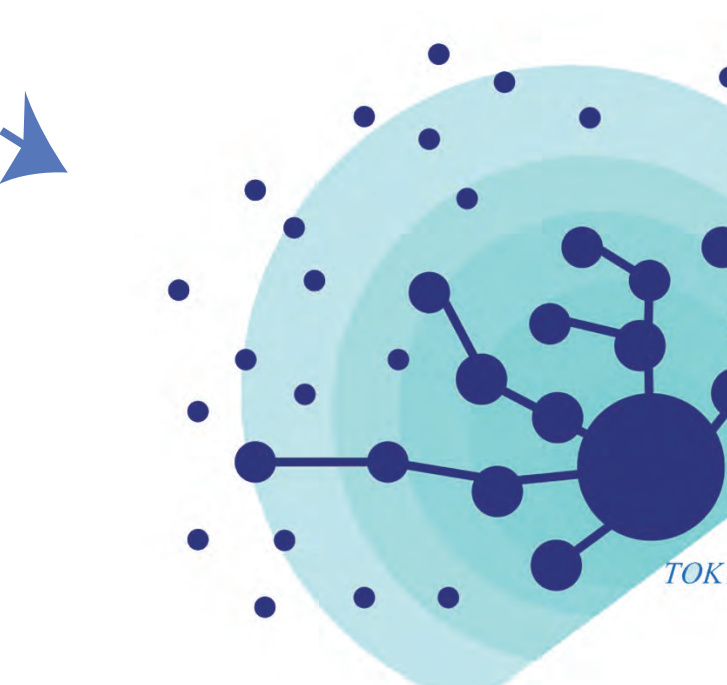
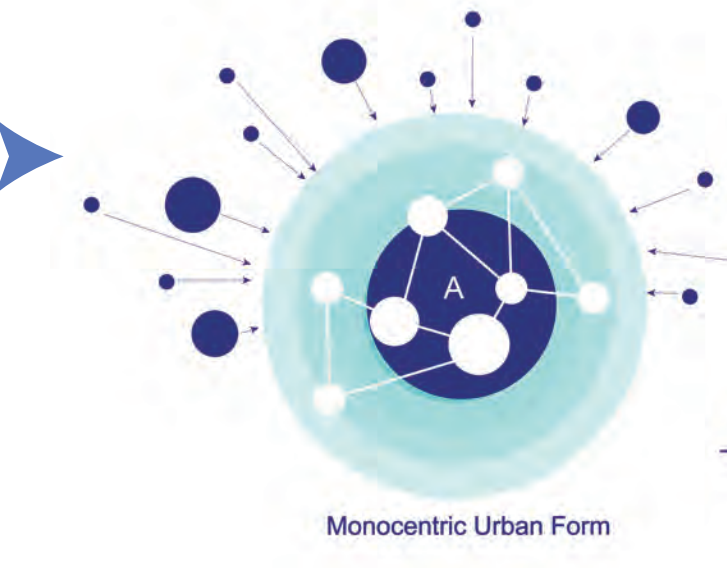
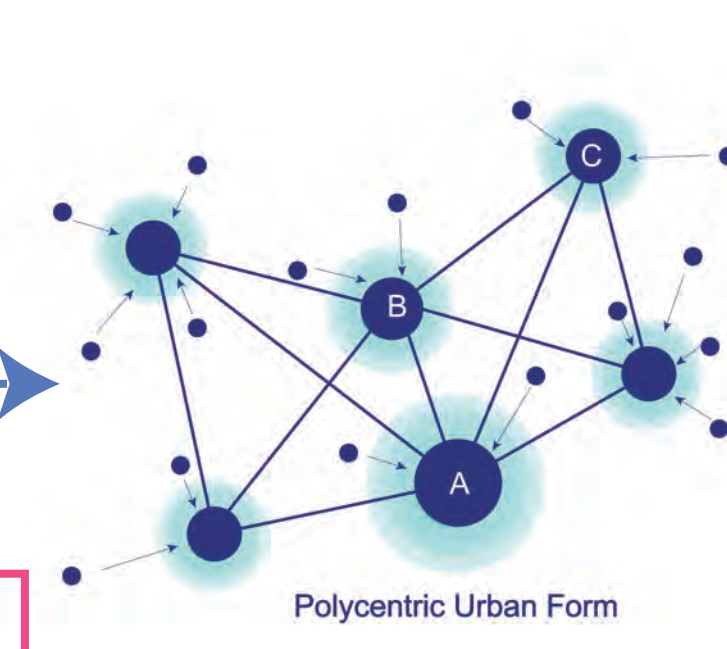
### SSP2 BAU



The share of CO2 emission in Tokyo, 2017



The projection of Tokyo Population changes by 2050 (Tokyo 23 wards)



### b) SSP1 Happiness & Local Vitality Polycentric Urban Form (Economic growth rate 2%)

Urban amenities are strongly emphasised. The centre area (Central Business District; CBD) has the highest density. Most of the old buildings and infrastructures are being renovated, and neighbourhoods are also regenerated while preserving local identities.

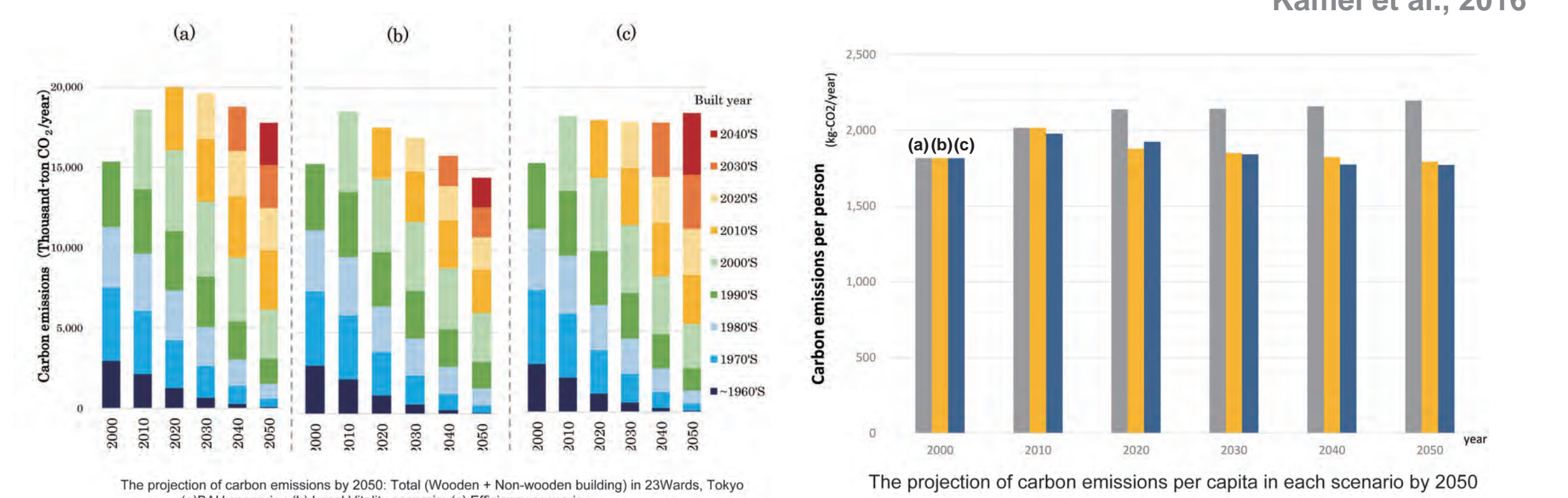
### c) SSP1 Efficiency Monocentric Urban Form (Economic growth rate 2%)

New technologies are introduced and adopted successfully. The population density of the centre area (23 wards) increases as suburbs decrease and some areas are abandoned. Large scale area developments are promoted rather than renovated. Old infrastructures can be effectively replaced with more efficient one.

### a) SSP2 Business As Usual Sprawl & functionally shrink (Economic growth rate 1%)

Aging populations and infrastructures cause serious expansions of social costs. The sprawling edge is gradually modified. However, elderly people remain in suburbs with old infrastructures that are in fragmented condition. The city centre lacks comfortable urban open spaces. Each urban cluster increases inequality and leads to social separation.

Kamei et al., 2016



Kamei et al., 2019