

Smart Energy City Action Forum

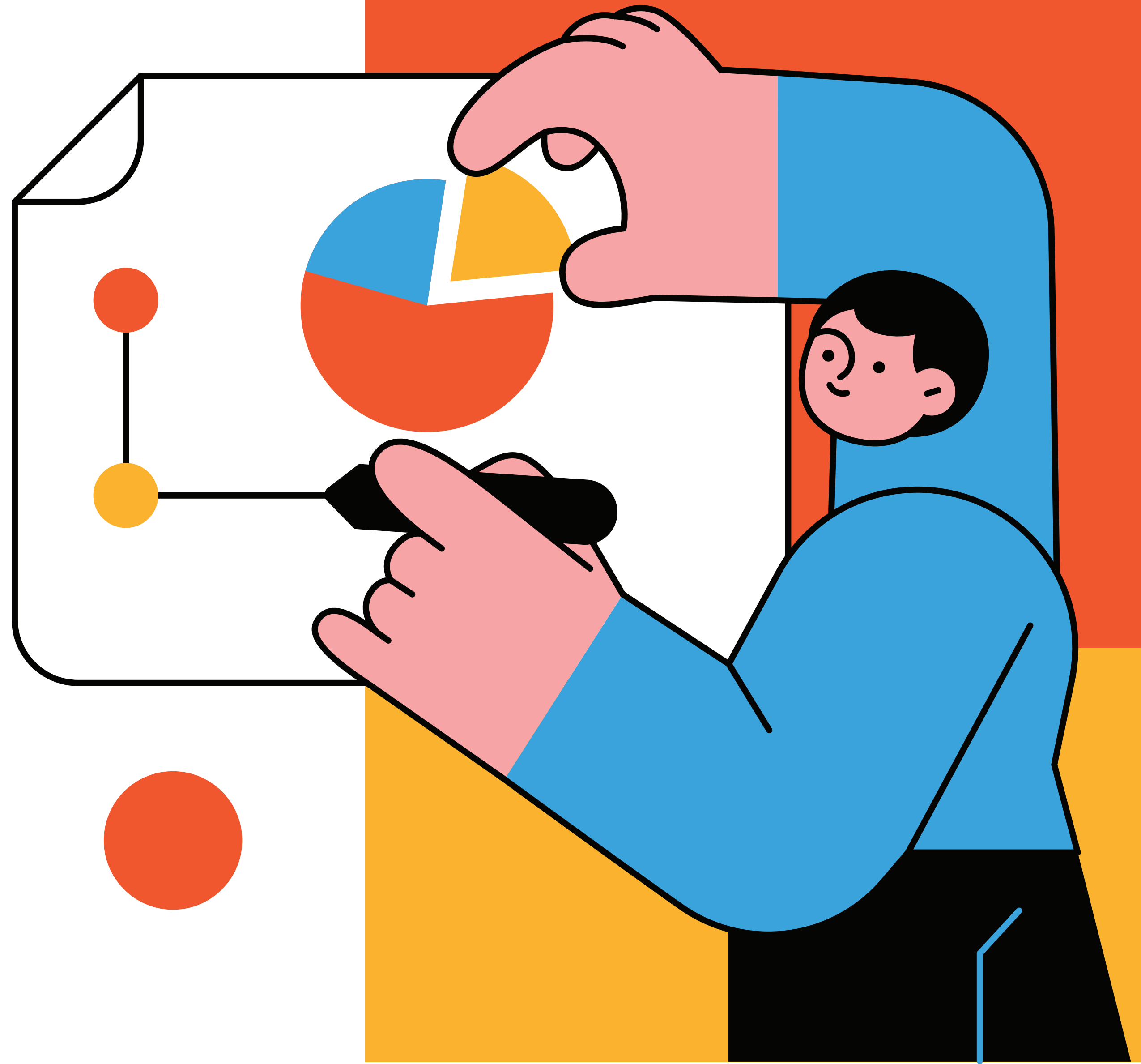
Energy based green ITS services on No- madic & Mobile for smart city mobility applications

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Smart Energy City Action Forum

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Energy based green ITS services
on Nomadic & Mobile for smart
city mobility applications



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1

Global Issues in Transportation

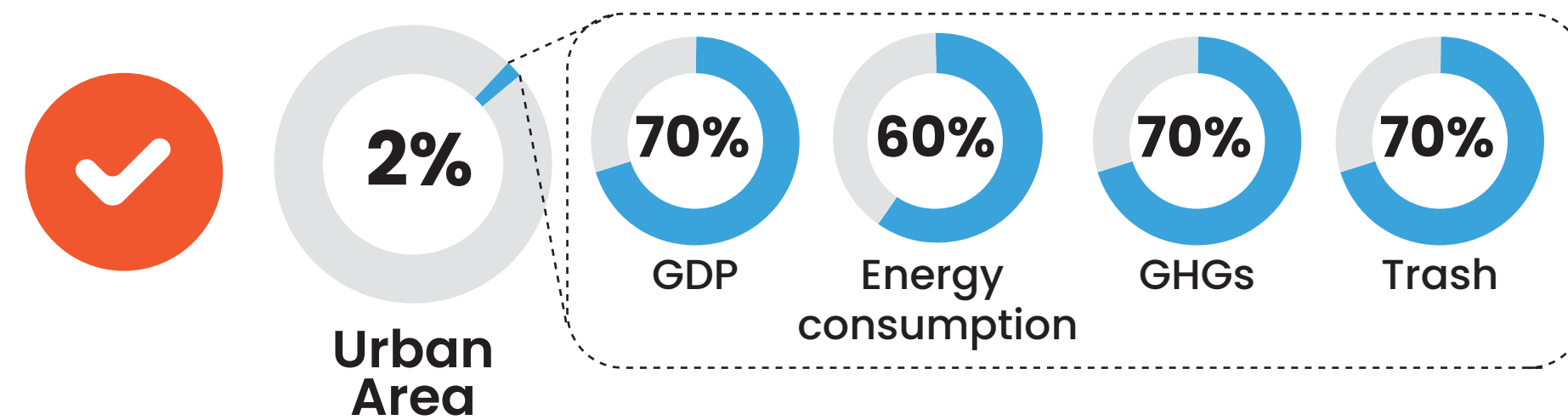


1

Global Issues in transportation

Causes

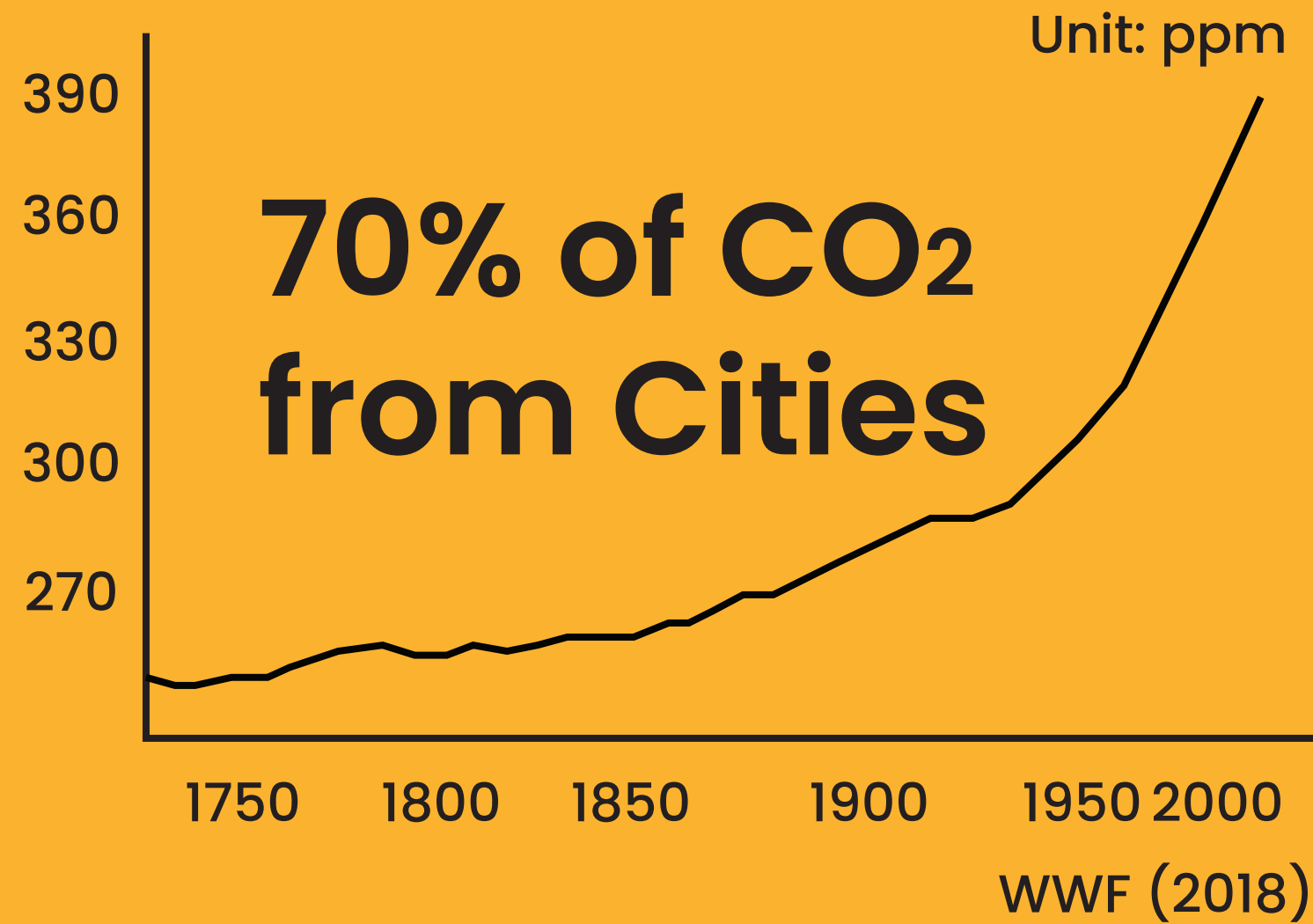
Energy consumption, and carbon emissions...
Focus on cities that account for only 2% of the world's area.



- ✓ Transportation 27% of urban energy
- ✓ 16% greenhouse gas emissions in the transportation sector.

Source : DNV-GL Trend survey(2018)



Carbon dioxide concentration (CO₂)

Global Issues in transportation

1

Causes

Carbon emissions and energy consumption are increasing rapidly, especially in cities.



Nations	Goal for 2030	To be carbon-neutral
EU	55% reduction compared to 1990	2050
USA	50% reduction compared to 2005	2050
KR	40% reduction compared to 2018	2050
Japan	46% reduction compared to 2013	2050
China	Carbon emissions peak	2060

Carbon emissions
Traffic congestion
Energy depletion



1 Global Issues in transportation **Questions**

- Are cities no longer sustainable?
- Is our transportation energy good enough for energy-conversion?
- City energy Safe?
- Mobility's carbon free?
- Fossil fuel Efficient and/or Effective?
- Mobility Sustainable?
(Environmental friendly)



2

Implementation Strategy in Smart City

2

Implementation strategy in Smart City

Smart City is preparing to energy conversion

Monitoring carbon emissions, Real time City total emissions

Anytime, anywhere, convenient for anyone
Inclusive Electric sharing Mobility

Environment

Efficiency

Sustainable

Convenience

Customized Service
Decreased Congestion
Smarter Traffic Management

Energy Self Diagnosis
and Controls Innovative
charging Infrastructure



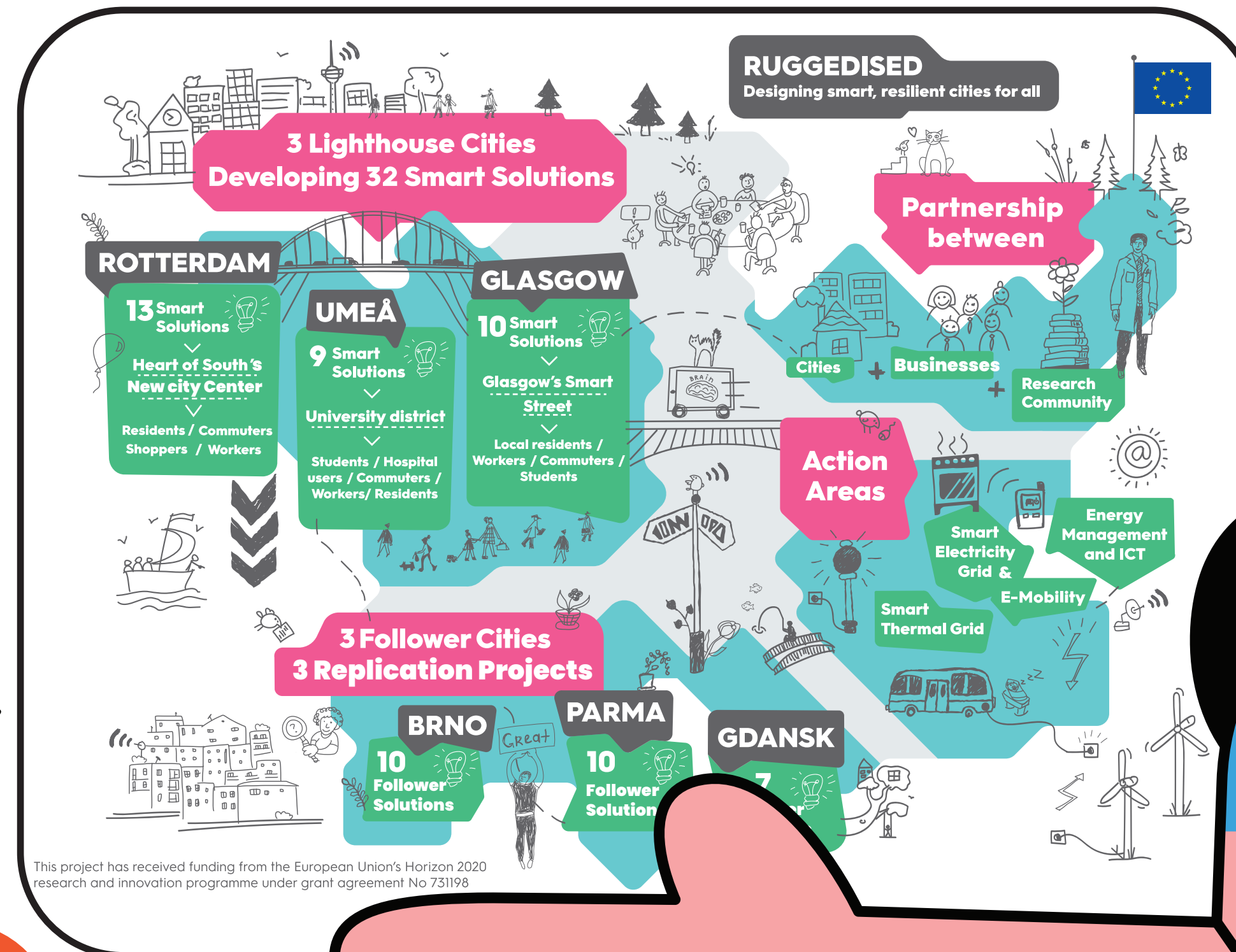
2

Implementation strategy in Smart City

Smart City is preparing to energy conversion

Reducing the environmental impacts of activities by achieving a significant reduction of CO2 emissions and a major increase in the investment and usage of renewable energy sources.

Electric buses
E-CHARGING – Street lighting
Renewable Energy Storage
Green mileage points
Electric Mobility as a Service



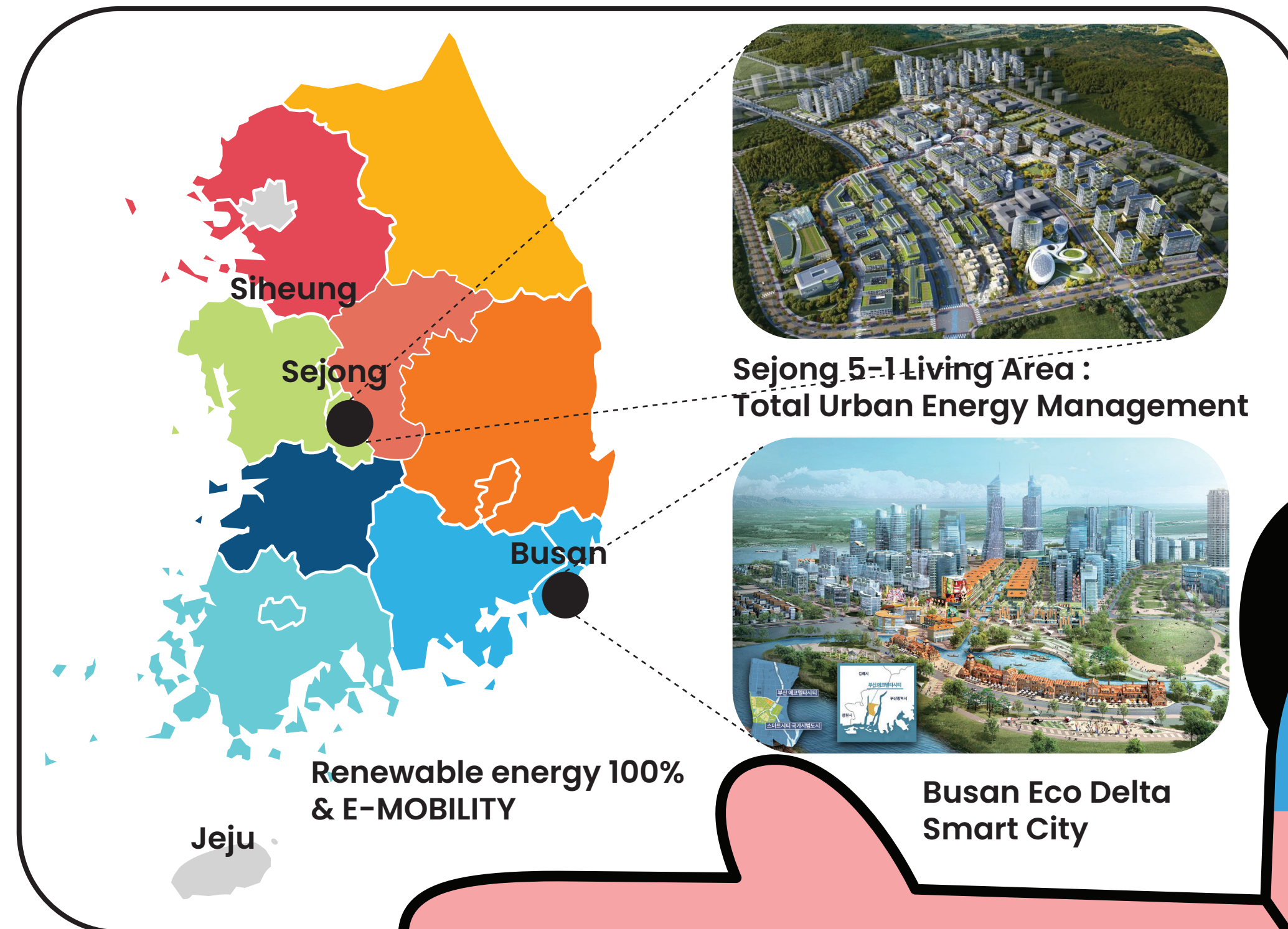
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Implementation strategy in Smart City

Smart City is preparing to energy conversion

Implementing a leading city for eco-friendly electric vehicles for decarbonization.

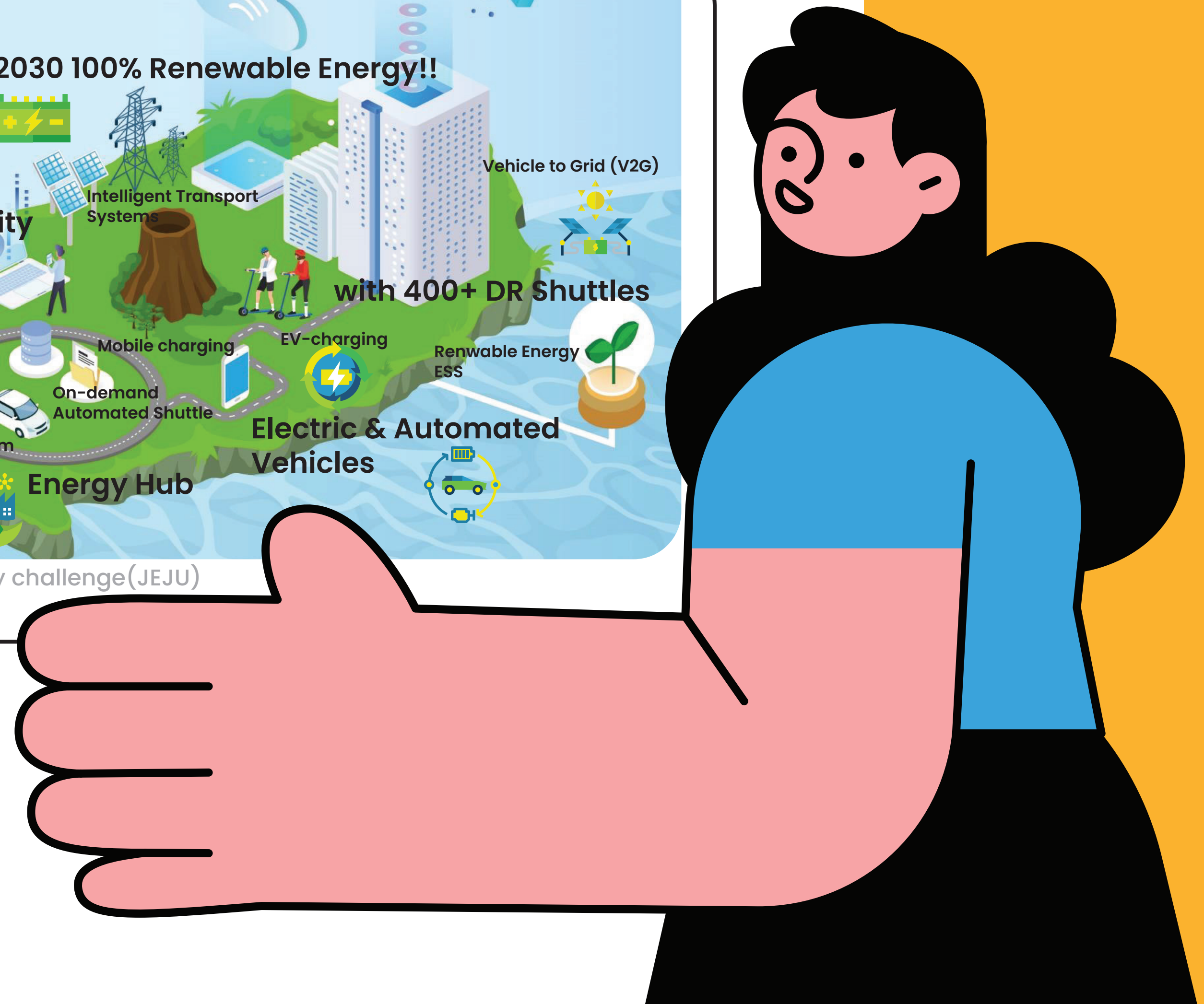
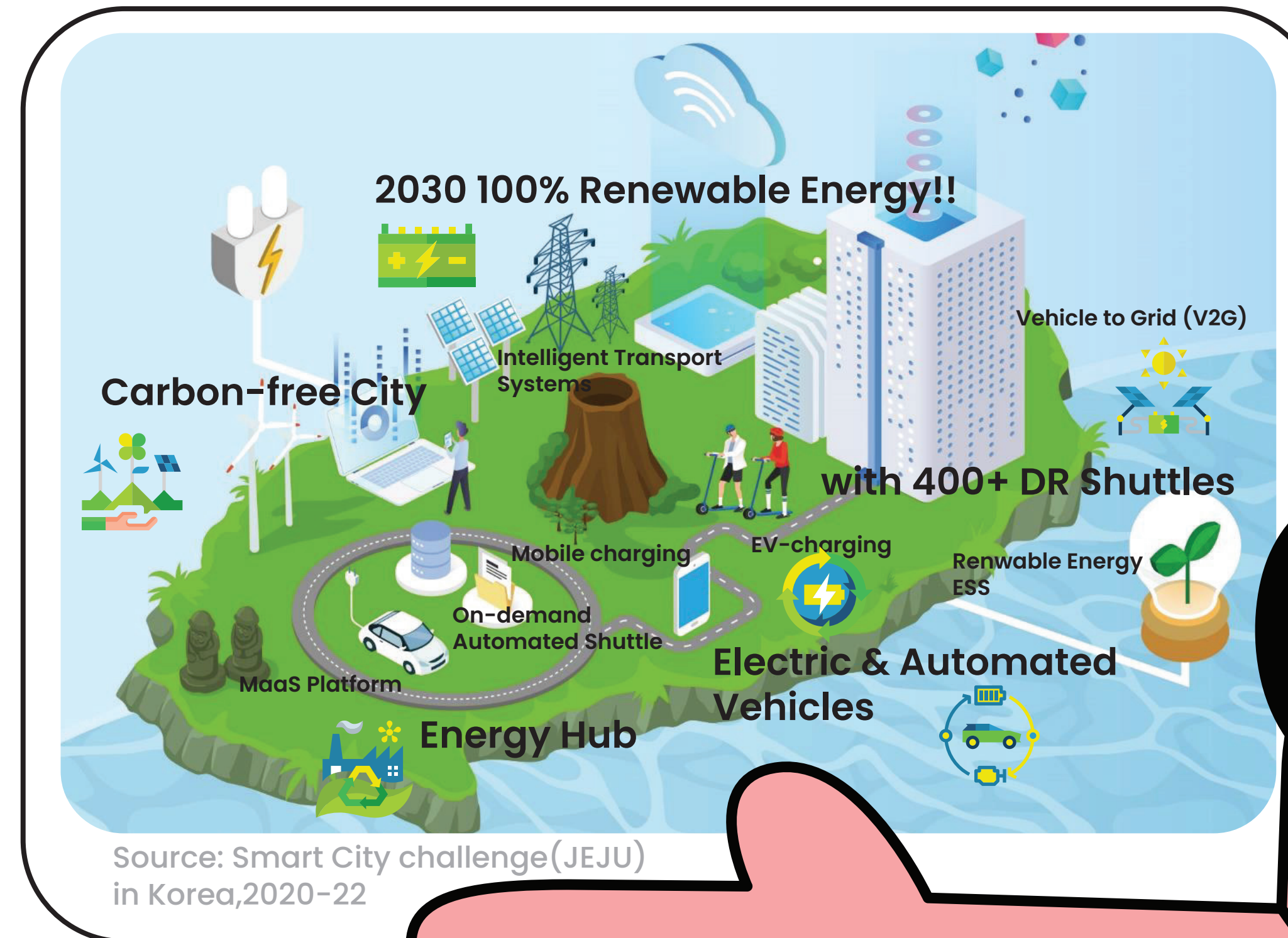
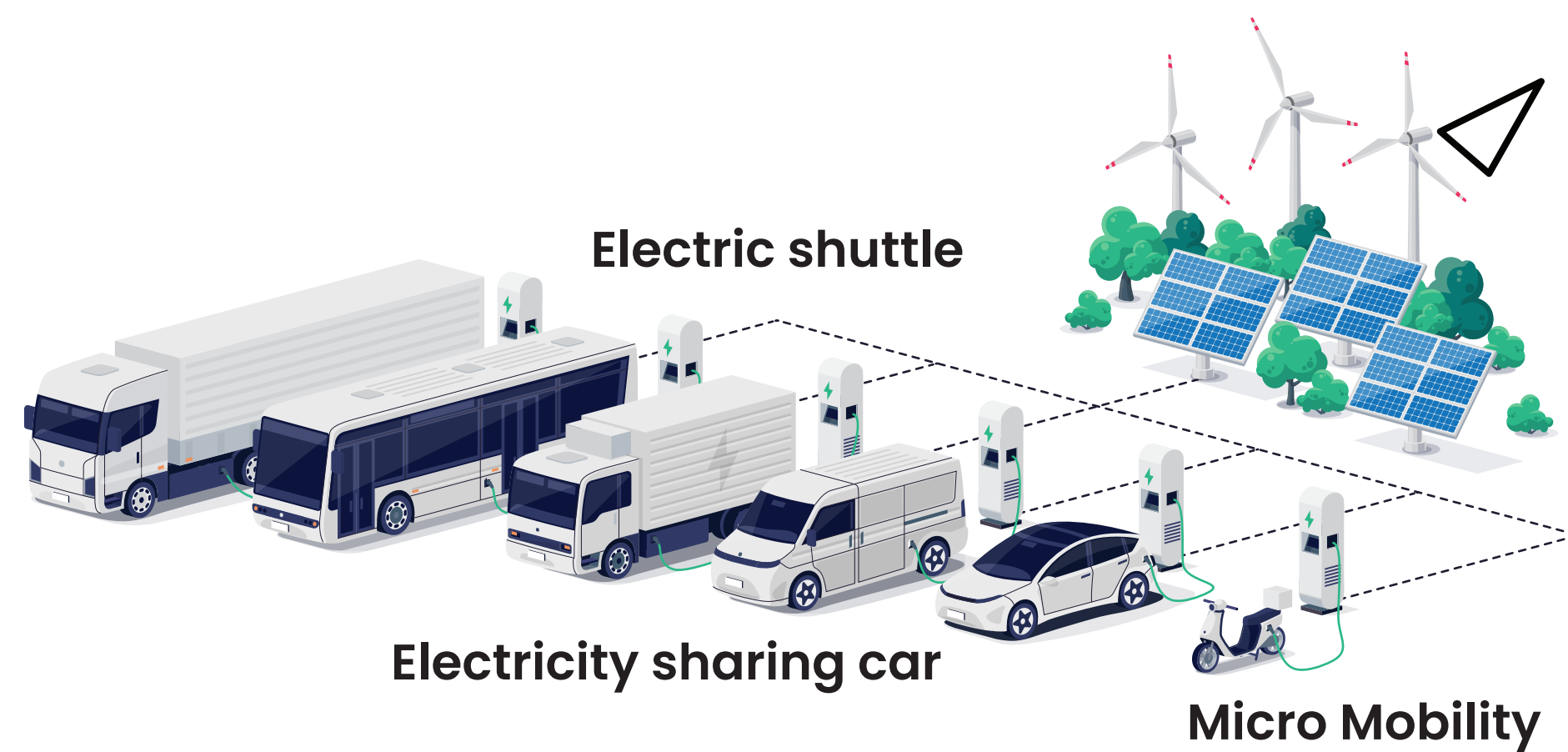
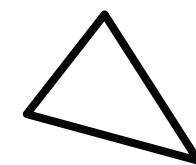
- Electric Autonomous shuttle
- Mobile E-charging system
- Renewable Energy storage
- Demand response (DR) system



2

Implementation strategy in Smart City

Smart City is preparing to energy conversion

All Electrification**e-3DA (DeCarbon,
DeStructure, DeCentralization Actor)**



3

**Energy based
green ITS
as a service**

Energy based green ITS as a Service

3

The need to switch to future mobility

Carbon Free Zone

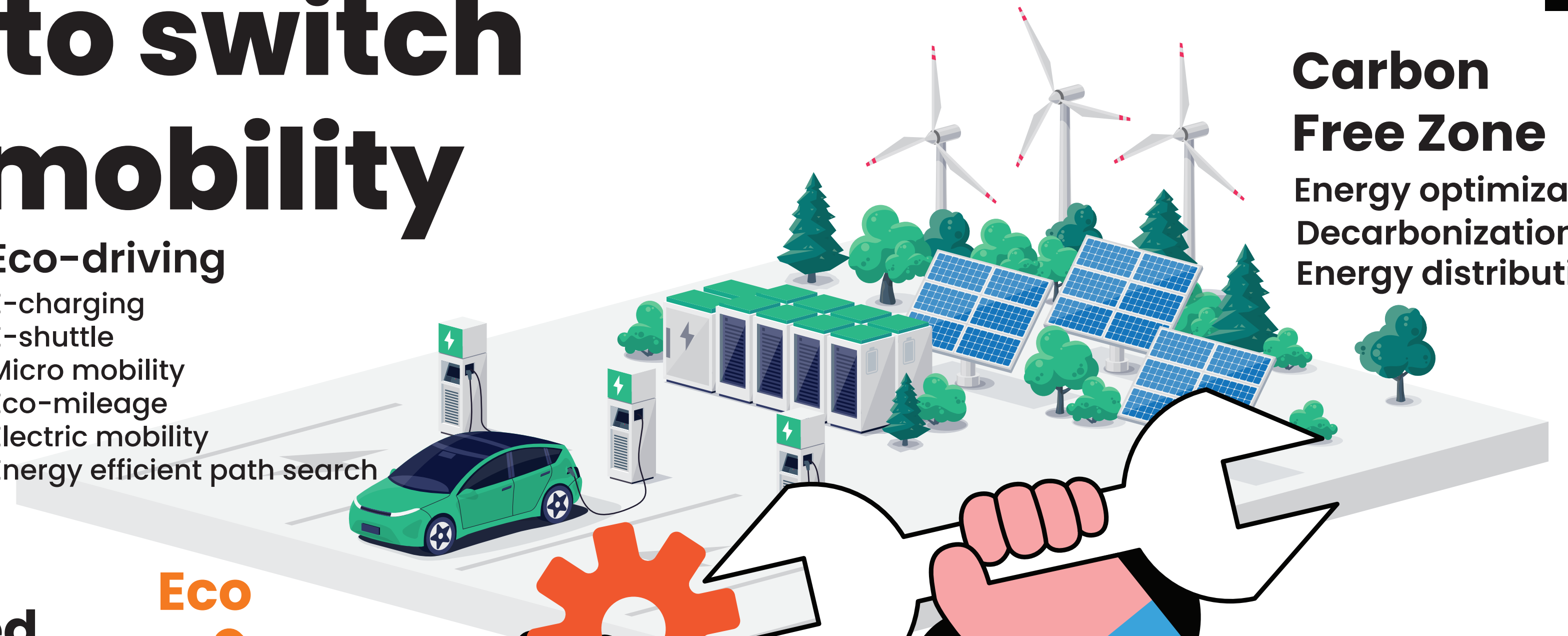
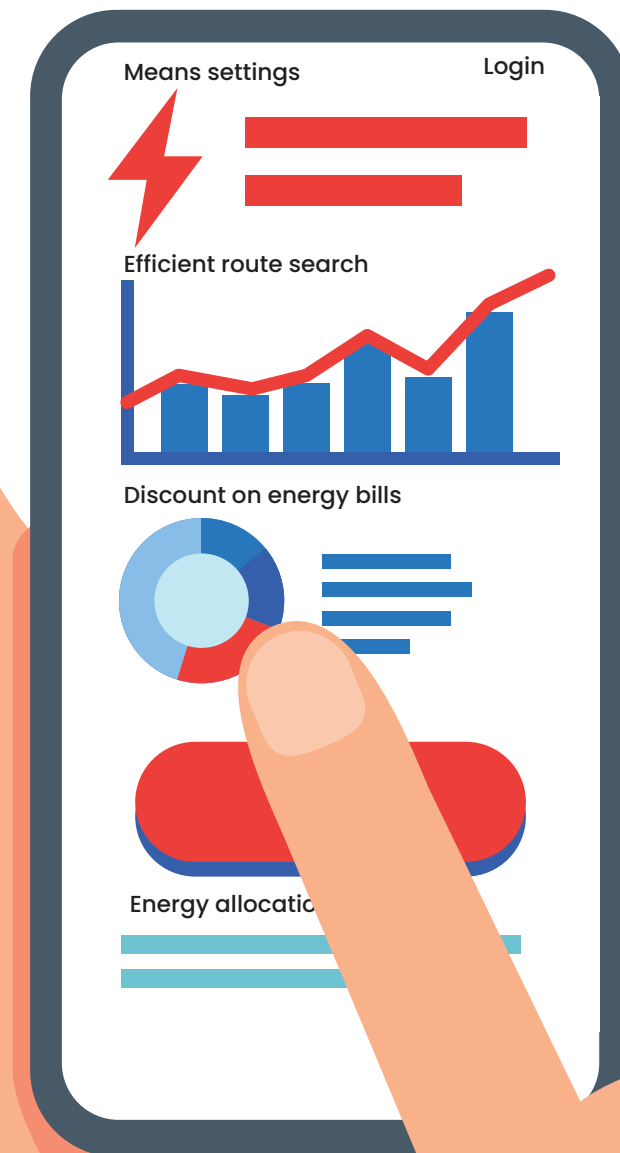
Energy optimization
Decarbonization &
Energy distribution

Eco-driving

E-charging
E-shuttle
Micro mobility
Eco-mileage
Electric mobility
Energy efficient path search

Energy included MaaS

Eco
Time Cost



3

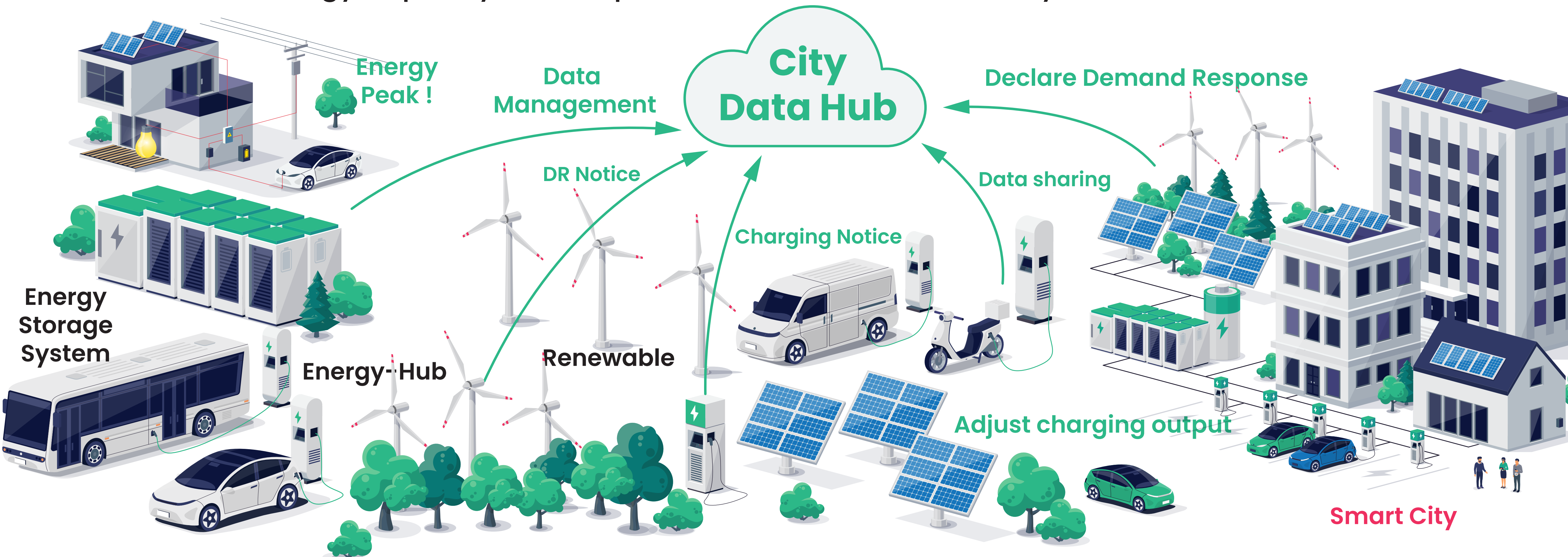
Energy based green ITS as a Service

14

The need to switch to future mobility

Energy based G-ITS as a Service

Urban transport management and smart city mobility applications by means of measuring energy consumption and CO2 emissions, managing total energy capacity in transportation sectors in smart city.



Energy based green ITS as a Service

Implementation Cases

Energy based G-ITS as a Service : OUTCOMES

Electricity-based mobility : Sustainability (Green or Eco)

Provide energy efficient paths and optimize electricity (Time & Cost)

Provide energy consumption in the path provided (Planning & Efficient)

Surplus electricity at a low price

Measure of Effectiveness in services

Carbon emissions, User energy consumption, etc..

Managing the total energy of transportation

Transport Tax upon Travel Miles (instead of on Fossil fuel)

Green Mileage Points for Public and shared Transport Users

Conservation of urban energy and maintenance cost reduction

Energy included MaaS operations and control

Energy peak load leveling, DR* Services

Prevention of peak load through an electric vehicle V2G

(Vehicle to Grid (V2G))

* DR : Demand Response(energy)





4

Standardization Proposal Strategy

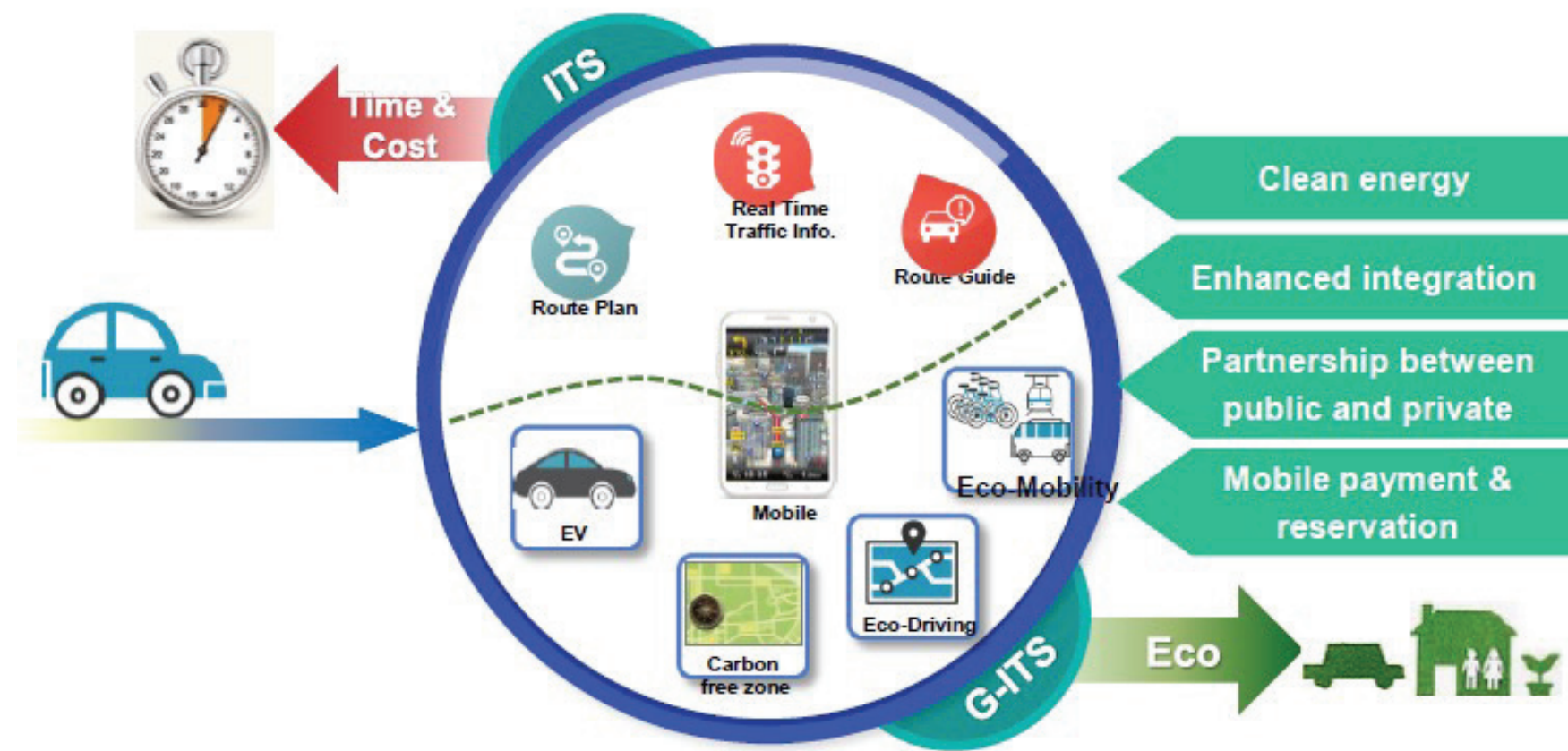


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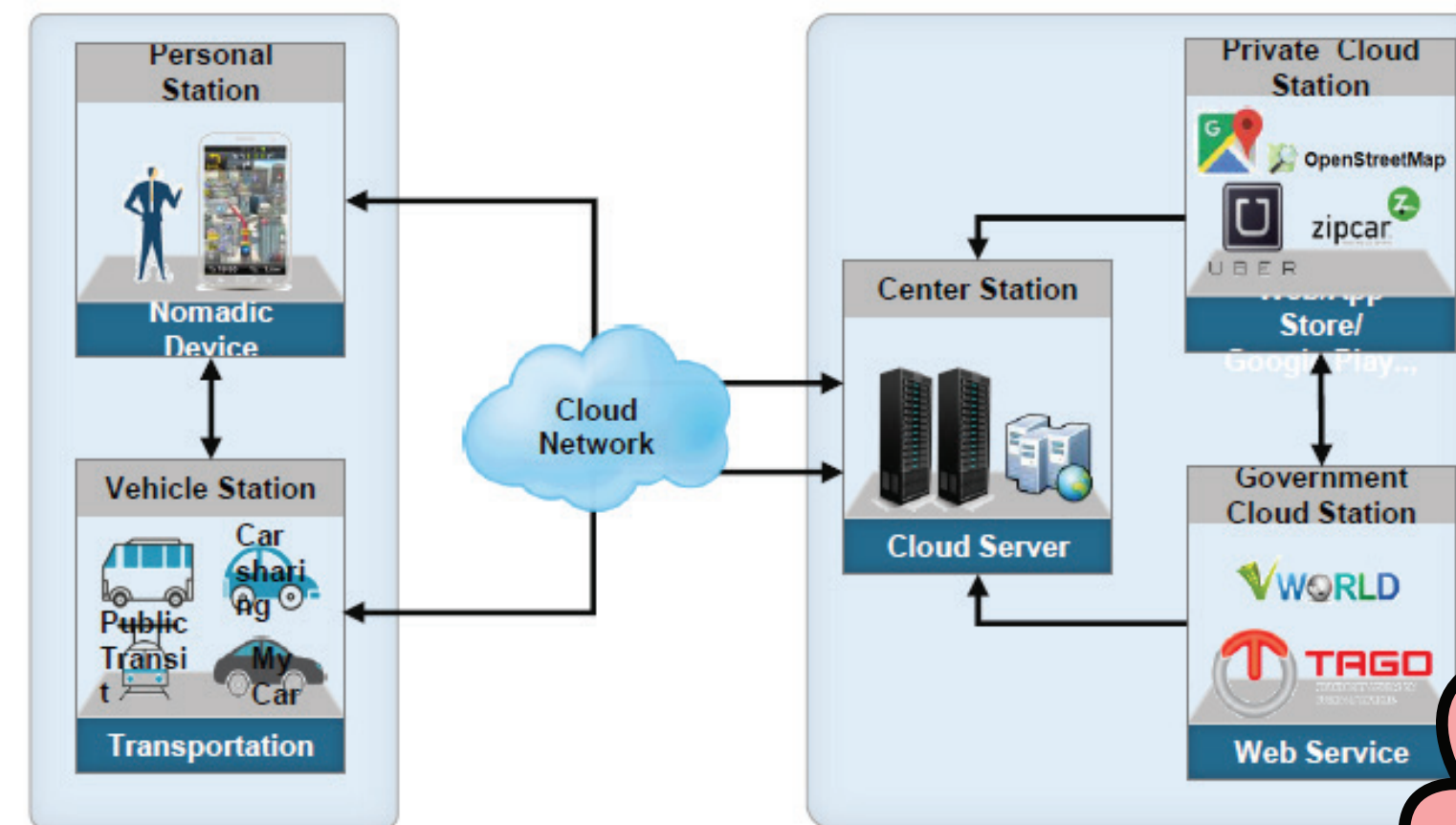
Standardization Proposal Strategy

Standardization Issues**ISO/TC204 WG17's Smart & Green Mobility challenges**

To be Environment Friendly, Sustainable Transport as **"Green"**
 Changing Travel Behavior and Trip Patterns to be **"Smart"**



ISO 18561 : Green transport management
Published



ISO 20529 : G-ITS Framework
Published



Standardization Issues

Domains of Interest: Nomadic & Mobile Devices for ITS Services

Providing driving/traveling information and route guidance on nomadic & mobile

NEW

Providing safety guidance on roadsides with all moving subjects including vulnerable road users (VRU) on nomadic & mobile devices

→ SWG17.1 to save the people on roadside thru nomadic & mobile devices

→ Fatalities zero

NEW

Promoting eco and/or green mobility services on nomadic & mobile devices, for both city operators and peoples living in the city for managing carbon-free and energy related mobility

→ SWG17.2 to save the planet in global warming thru nomadic & mobile devices

→ Net zero

Standardization Issues

ISO/TC204 WG17's New Sub Work Group(SWG 17.2) Proposal

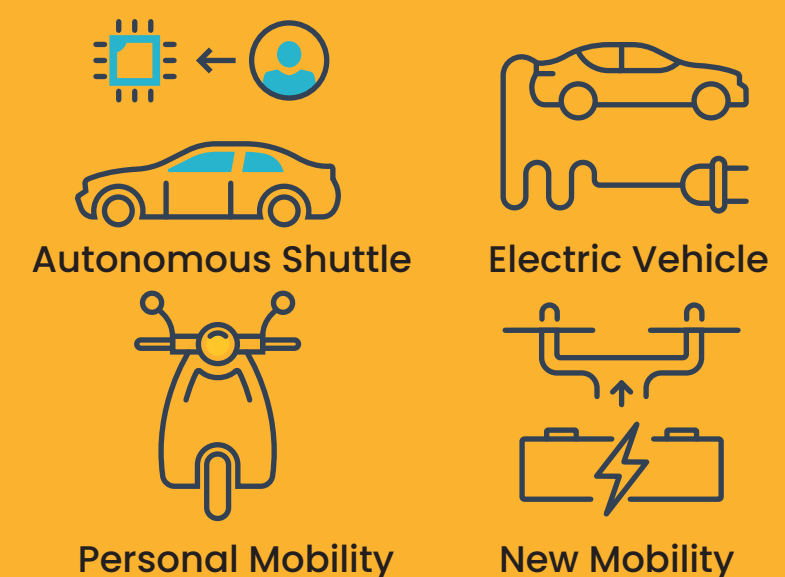
This SWG discusses to develop a series of international standards which define the MaaS, Green Transport, Electric Mobility and specify general requirements and use-cases for providing the services on nomadic & mobile devices

- Shifting to Sustainable Transport Modes "Green"
- Improving Efficiency of all Transport Modes "Smart"

Countries agreed to participate

- China, New Zealand, Australia, South Africa, Hungary and Korea
- Sub-Convenor : Peter SCHMITTING, ERTICO

SWG17.2 : Adaptable to SUSTAINABILITY



Standardization Proposal Strat-

4 Standardization Issues

How will we approach SWG17.2?

Smart city-based transportation-energy services require a Nomadic device-based data platform, and general issues and use case definitions for this service should be specified as TR.

It will contain additional use cases of participating countries in SWG17.2

Main Scope

- The general information for energy-based Green ITS as a service using nomadic & mobile devices.
- Various use cases with the requirements for energy-based Green ITS services using nomadic & mobile devices.
- The use cases in this technical report are for the energy-based mobility services to be used electric vehicles, transportation infrastructure, and other mobility services using nomadic devices.



Standardization Proposal Strategy

Standardization Issues

ISO PWI 17748-1 Committee Internal Ballot

Title: General information and use case definitions

4 Use Case clusters defined

1. Energy saving MaaS
2. Traffic energy management
3. Energy based information & navigation
4. Mobile charging services

Draft document with 19 UC tables available
Source: International & Domestic Smart City
Further inputs?

ISO/TC 204/WG 17 "Homadic Devices in ITS Systems"

Call for contribution for Intelligent Transport Systems specific use cases regarding Energy-based green ITS services

Green ITS is a new concept for transportation systems, which arises following the paradigm shift towards eco-friendly, low-carbon green growth in the transportation sector, as a global policy (Source: ISO/TR 20529-1:2017 "Intelligent transport systems – Framework for green ITS (G-ITS) standards").

Energy-based green ITS service is a future Smart City data platform service that reduces green growth consistent with power supply-demand using various ICT-based user technologies such as smartphones, integrated data platforms, and connected vehicles, etc. in order to transform the existing traffic efficiency and safety paradigm into an energy efficient system, it aims to allocate/distribute urban energy to manage the energy of individual users as well as real-time operation management of complex transportation through connection with information systems such as generation information, control price information, and charging infrastructure.

ISO/TC 204 has decided to cover this important topic in a new sub-working group (SWG) as part of its working group (WG) 17 on Homadic Devices in ITS Systems. This new SWG17.2 is developing a series of international standards which define energy-based green ITS services providing urban transport management and smart city mobility applications on nomadic & mobile devices by means of not only measuring energy consumption and CO₂ emissions but also providing information to users on energy capacity in transportation sectors in the smart city.

As a first output from SWG17.2, ISO/PAH TR 17748-1 "Energy-based green ITS services on nomadic & mobile devices for smart city mobility applications – Part 1: General information and use cases definition" has been officially added to the ISO work programme by ISO/TC 204.

ISO/TC 204/WG17 invites interested parties to contribute to the work of SWG17.2 and to provide Intelligent Transport Systems specific use cases that take advantage of Energy-based green ITS as input to TR17748-1, using the following template:

Use case name	
Goal	
Actors	
Goal description	
Technical description (optional)	
Data characteristics (optional)	
Challenges (optional)	

Use case name: Please do not exceed 20 words.

Goal: Please briefly describe the scope of the use case, what it is to be achieved, who are the intended beneficiaries of the use case.

Actors: Please identify the main stakeholders. A stakeholder is any individual, group, or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.

Goal description: Please do not exceed 500 words. Please provide a short description of the proposed use case. (Use case scenario, Use case methods, relevance to Energy-based Green ITS).

Page 1 of 2

ISO/TC 204/WG 17 "Homadic Devices in ITS Systems"

Technical description (optional): Please provide key technical characteristics of the use case (e.g., tasks, methods, models, frameworks, platforms, level of automation, deployment models, key performance indicators).

Data characteristics (optional): Please provide:

- (1) information on all types of data that are mandatory in the context of the use case;
- (2) the sources of data (e.g., customers, mobility, infrastructure), the data variety (e.g., in terms of format, structure, structured data, images), the data variability (e.g., changes in data rate, format/structure, semantics, and/or quality of data).

Challenges (optional): Please describe the threats, vulnerabilities and issues associated with the use case.

Please send your contributions to: Peter Schumling (ISO/TC 204/WG17.2 Co-Chair) – p.schumling@tnt-telecom.com, before the ISO/TC 204/WG17.2 September – 2023 (2023-09-05), and Jan Heughebaert (ISO/PAH TR 17748-1 Project Leader) – janheughebaert@tnt-telecom.com, before 31 January 2023.

Please include the contact details (name, email address) of a person who can answer technical questions on the use cases submitted. If relevant, please also add implementation references (e.g., project name and website).

If you have any questions, please do not hesitate to contact us. Thank you in advance for your cooperation.

ISO official statements:

ISO/TC 204 Resolution 1462 (Source: ISO/TC 204 N 5232 "The 39th ISO/TC 204 Plenary Resolution"), ISO/TC 204-22 items:

"ISO/TC 204 notes:

"ISO/TC 204 SWG17 resolves to create the following new Work Item: Intelligent transport systems – Energy-based green ITS services on nomadic & mobile devices for smart city mobility applications – Part 1: General information and use cases definition

– SWG17.2 discusses developing the series of international standards which define energy-based green ITS services providing urban transport management and smart city mobility applications on nomadic & mobile devices by means of not only measuring energy consumption and CO₂ emissions but also providing information to users on energy capacity in transportation sectors in smart city.

Target: 2024

Call for contribution
22.12.9 ~ 23.2.28

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< Call for contribution for use cases >

4

Standardization Issues

More parts (IS) to follow

In addition, Nomadic-based devices and platforms are for traffic and energy data input and require data sharing functions and protocols, Interface.

(ISO 17748) Energy-based green ITS services on Nomadic & Mobile for smart city mobility applications –

part 1. General information and use case definitions

part 2. Data structure and dataset definitions

part 3. Data exchange procedures between ITS stations

PWI

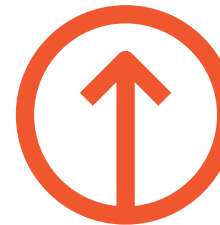
This part 1 standard defines the service framework and guidelines

First of all,
Proposal guidelines TR

Vision and Goals

Foundation for Standardization of Smart Cities

Eco-friendly and Advanced, Mobility Service on Smartcity



Preemptive Development of Standards in smart city

To Enable systematic data exchange between transportation and energy domains

Growth in
Smartcity
services

Smart city
Pilot Project

Establishing
standard
ecosystem

Standard
long-term
roadmap

Global
Compatibility

Creation of
new industries

Innovative charging Infrastructure / Energy Self diagnosis and control
based on Real time City monitoring / Energy Efficient Path Navigation /
Energy Guided green ITS as a Service

Smart Energy City Action Forum

Energy based green ITS services on No- madic & Mobile for smart city mobility applications

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