

Carbon Neutral & Smart City

Practical City Experience in Korea





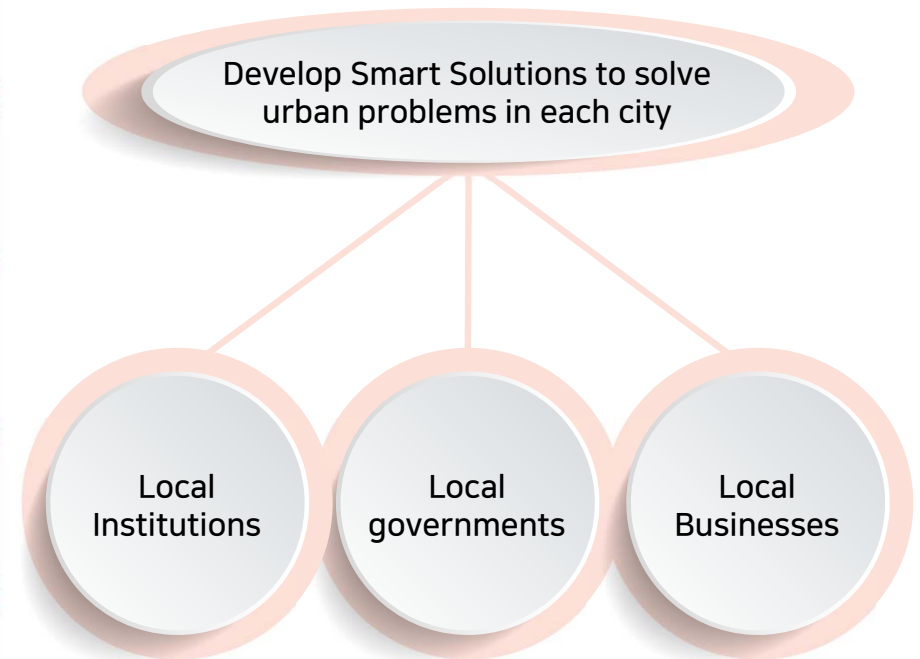
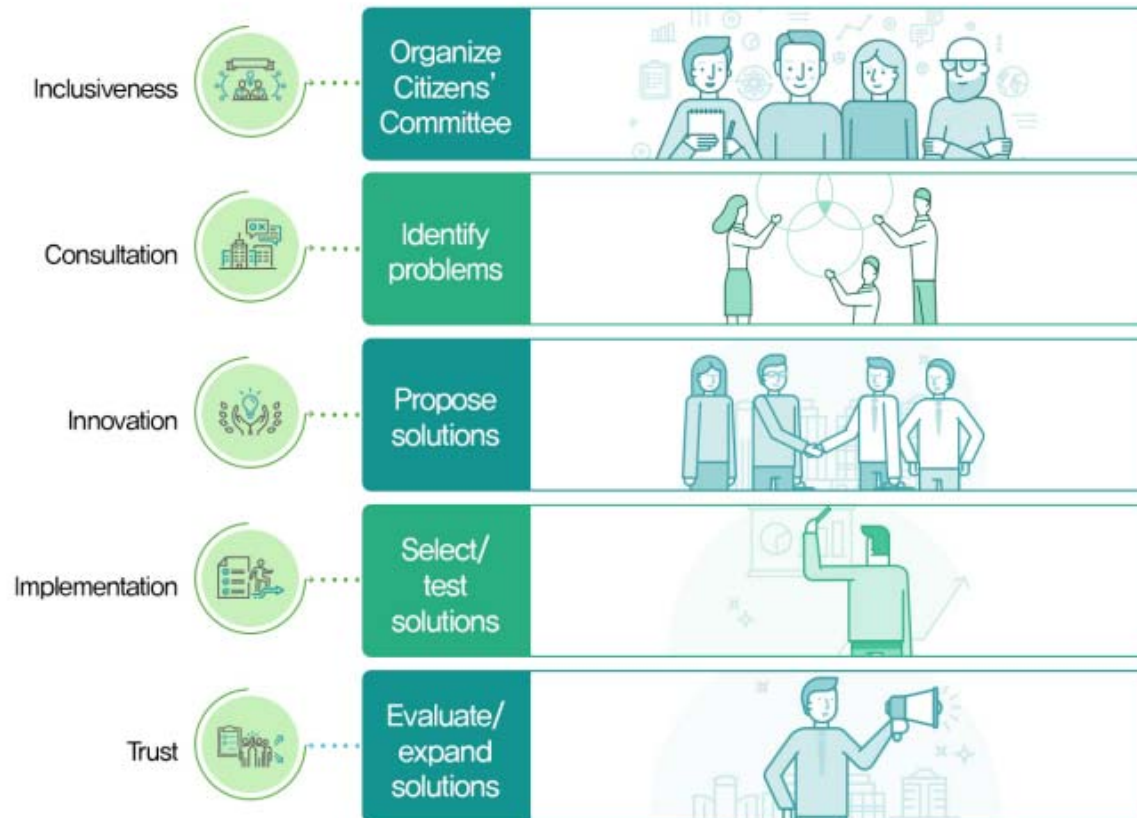
01

National Policy for Smart City

☑ Since 2013, MOLIT* has continued policies for making cities 'Smart'

* the Ministry of Land, Infrastructure & Transport

- Actively operating "Living Labs" that supports creating local smart solutions to solve each city's problems
: MOLIT annually supports selected local stakeholders consisting of public and private parties through 'Smart City Challenge Project'





01 National Policy for Carbon Neutral Green City

☑ In 2022, MOE* began the 'Carbon Neutral Green City' project

* the Ministry of Environment

- Providing local governments subsidies to implement various projects to achieve cities' carbon neutrality
 - : MOE collaborates with other ministries including MOLIT to support local-led projects such as developing building energy platforms, etc.
 - : Suwon and Chungju became the 1st cities in which the project takes place
 - : The projects are funded by both national and local governments, 60% of the total budget from national government
- The plans of those two cities focus on energy transition in building and mobility, urban space, active transportation

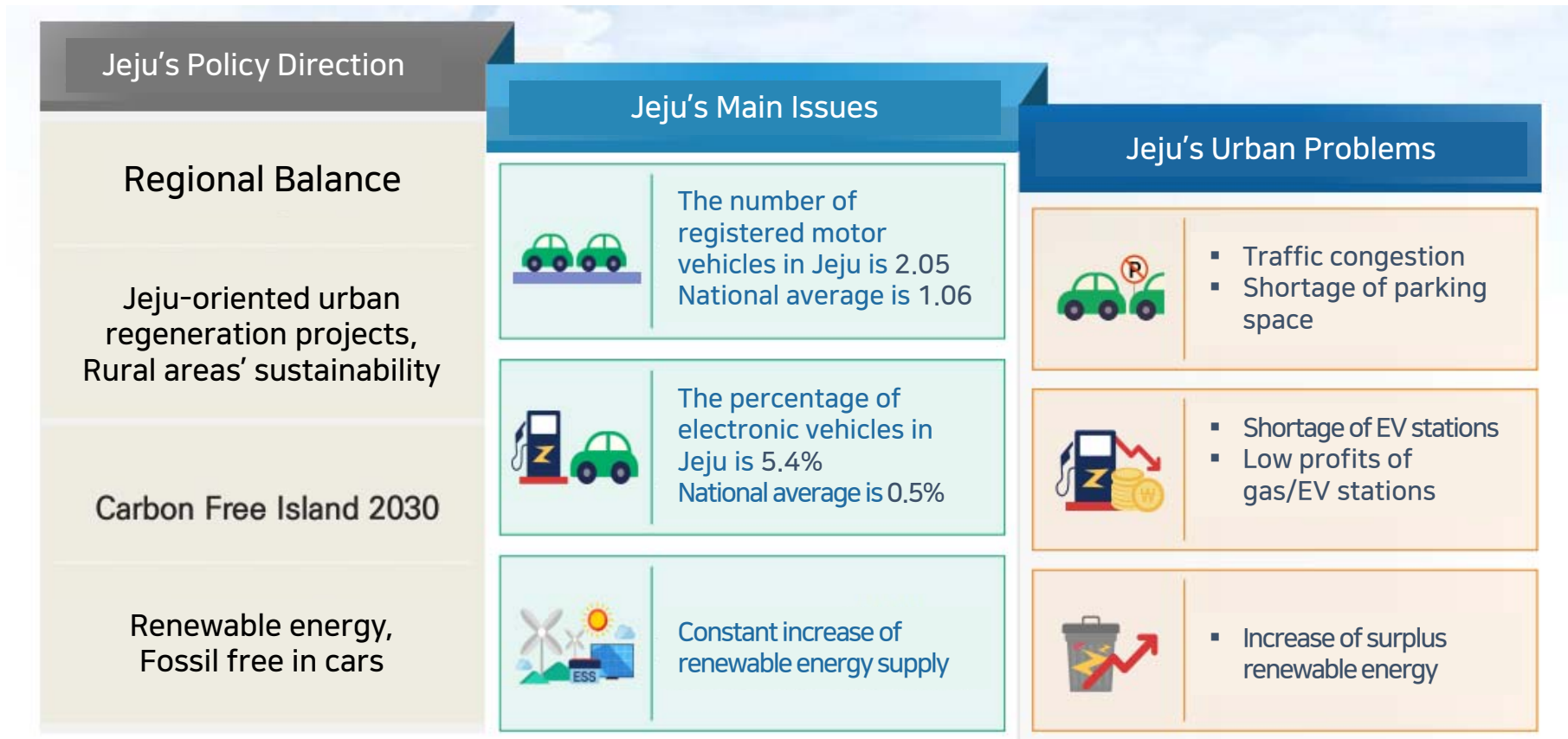




02 Local Case (1) : Sustainable and Smart Jeju Island

☑ Understanding Jeju's context

- Transportation and renewable energy are the keywords of Jeju's proposal
 - : Traffic congestion, shortage of parking spaces and gas/EV stations are major urban problems in Jeju
 - : The number of Electronic Vehicles in Jeju continue to increase
 - : Renewable energy (mainly wind power) market grows





02 Local Case (1) : Sustainable and Smart Jeju Island

☑ Seeking smart solutions

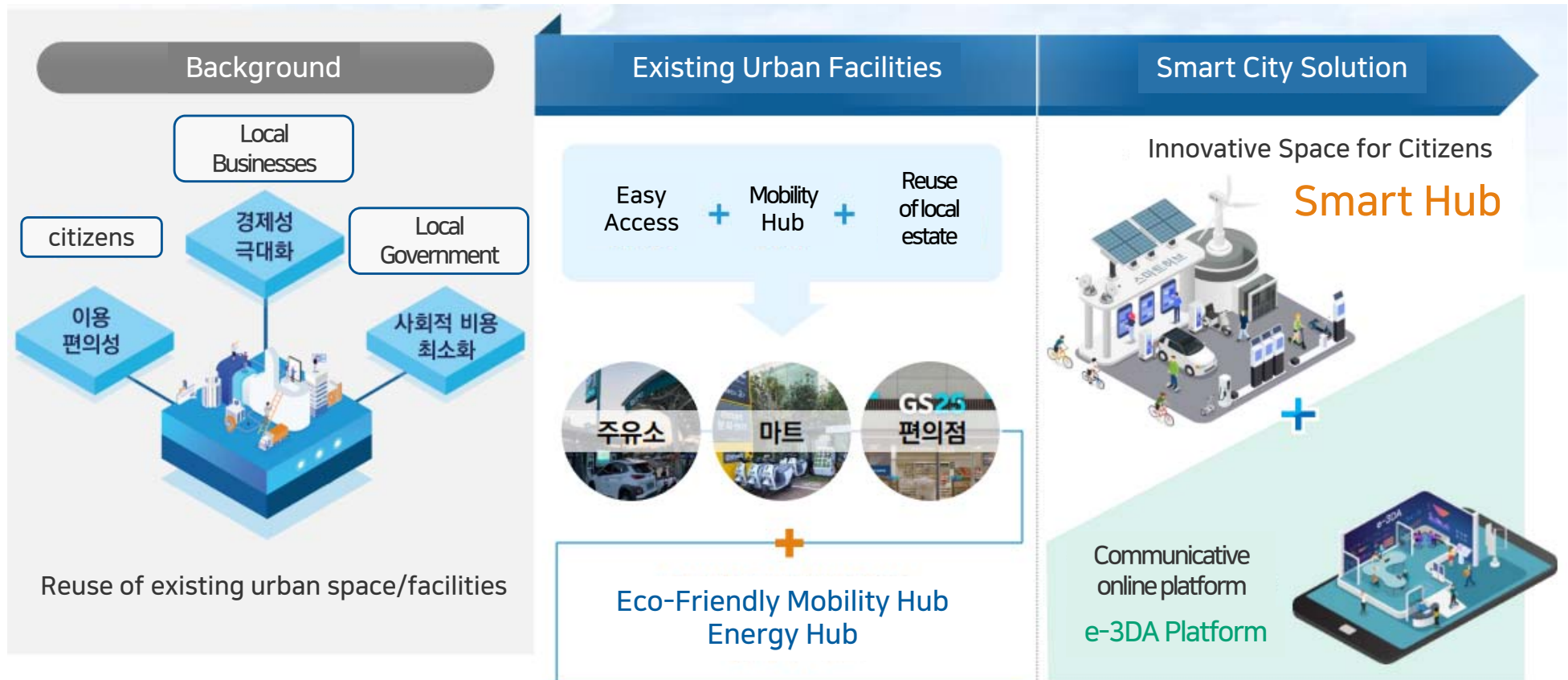
- Jeju's solutions pursue establishing the integrated policies of mobility, energy, and urban infrastructure
 - : Current mobility issues in Jeju are related to problems of spatial facilities such as the shortage of parking lots and EV stations
 - : Energy problems require stable market environment and smart management of surplus renewable energy



02 Local Case (1) : Sustainable and Smart Jeju Island

☑ Solution: Transform local gas stations, convenience and grocery stores into Smart Hubs

- Reusing existing urban facilities such as gas stations, commercial stores as shared mobility and EV stations
 - : Reforming gas stations or small commercial facilities to provide EV charging for shared mobility
 - : Remodeled facilities are also used as transportation nodes between EVs and PM
- Creating an online platform for shared green mobility service, EV charging system, etc.



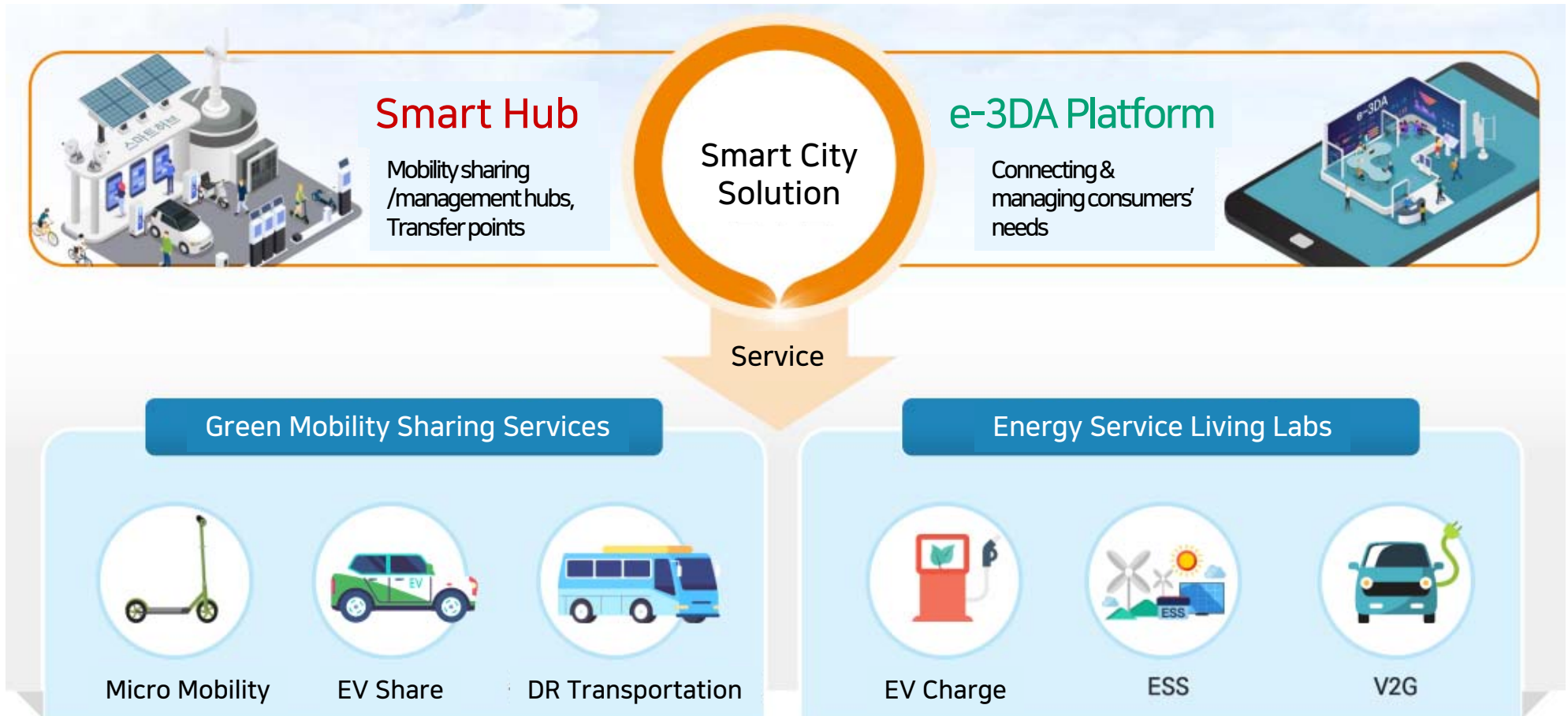


02 Local Case (1) : Sustainable and Smart Jeju Island

☑ Solution: Transform local gas stations, convenience and grocery stores into Smart Hubs

- Reusing existing urban facilities such as gas stations, commercial stores as shared mobility and EV stations

Recreation of Urban Infrastructure with Online Platform Service

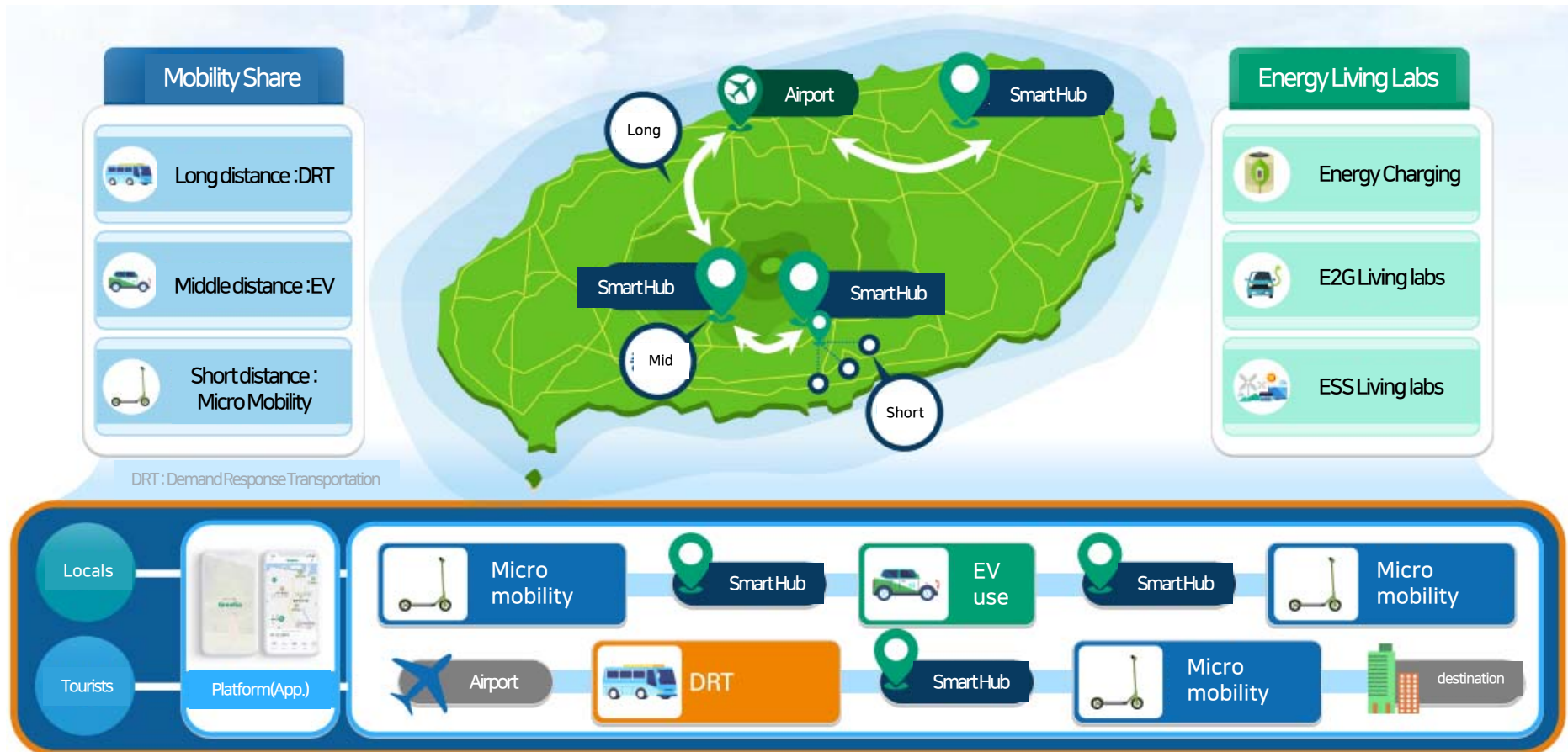




02 Local Case (1) : Sustainable and Smart Jeju Island

☑ Solution: Transform local gas stations, convenience and grocery stores into Smart Hubs

- Providing online platform service that connects and manages green mobility needs
- Enhancing the usage, storage, and exchange system of renewable energy for mobility



Local Case (2) : Seoul “Energy Innovation District, Yangcheon-gu”

☑ Seoul expands its energy district project to reduce GHGs emission at neighborhood level

- Seoul continues to evolve as a leading city of energy self-sufficiency and carbon reduction

- : Self-sufficient energy is an important strategy to make neighborhoods sustainable in terms of climate action, Seoul
- : Energy Innovation District projects focus on bridging the gap between energy efficiency and carbon reduction by transforming the old patterns of energy use, waste management, building management, and etc.

Yangcheon-gu Energy Innovation District Map



Seoul Energy Self-Sufficient Village Location





02

Local Case (2) : Seoul Energy Information Platform

Seoul provides the public an open-access platform of energy information

- People can find the patterns of energy use and GHGs, the amount of carbon emission by types in Seoul
 - : The platform keeps updating the patterns of gas, thermal, electricity, water use and the amount of carbon emission by 25 administrative divisions in Seoul

에너지원별 CO₂배출량 2021년 12월 기준

전기	1,597,700 tCO ₂
가스	1,174,355 tCO ₂
수도	27,828 tCO ₂
열	121,623 tCO ₂

열: 42%
수도: 1.0%

에너지원별 CO₂배출량 추이

연도별 전력 사용량 [MWh]

연도	전력 사용량 [MWh]
2017년	~40,000,000
2018년	~40,000,000
2019년	~40,000,000
2020년	~40,000,000
2021년	~40,000,000

에너지정보 현황 2021년 12월 기준

전기 사용량	3,477,797 MWh
가스 사용량	539,116,269 Nm ³
수도 사용량	83,819,890 m ³
열 사용량	794,415 Gcal

자치구별 온실가스 절감량 현황

구분	배출량(tCO ₂) (2021.12)	전년동월대비(tCO ₂) (2020.12)
강남구	256,216	6,412
강동구	93,376	4,144
강북구	63,834	-2,313
강서구	152,584	1,039
관악구	129,050	-3,554

동별 에너지 사용량

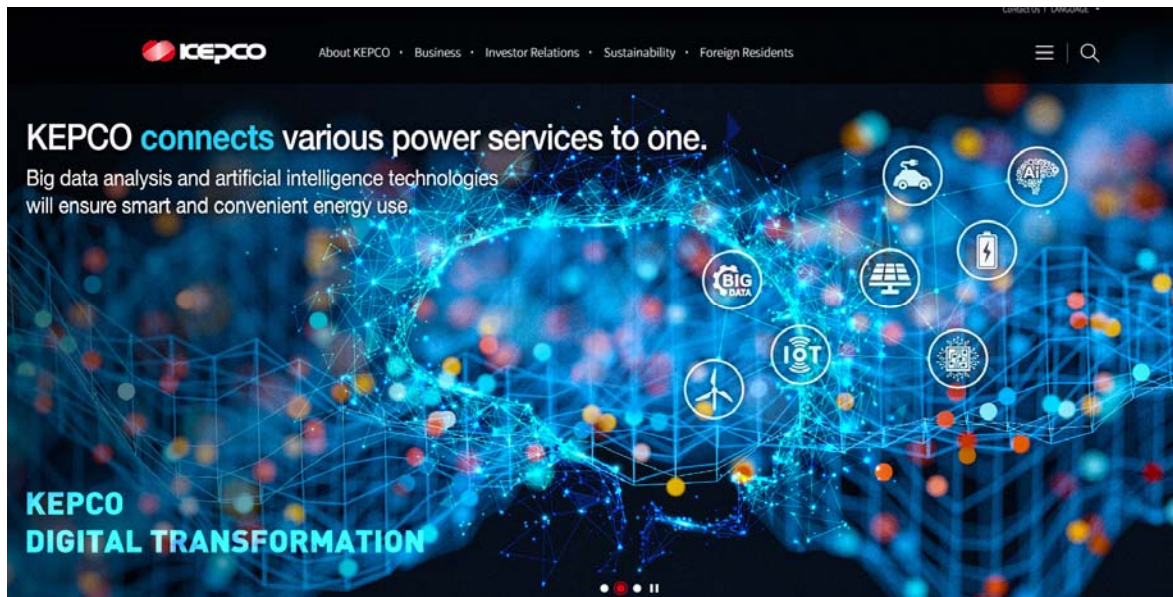
동	전기	가스	수도	열
역삼1동	~100,000	~100,000	~100,000	~100,000
역삼2동	~100,000	~100,000	~100,000	~100,000
삼성1동	~100,000	~100,000	~100,000	~100,000
삼성2동	~100,000	~100,000	~100,000	~100,000

☑ Missing links between smart technology and carbon emission reduction in public policy

- In Korea, national and local governments implement their smart city and carbon policies separately
- However, those policies are mixed in project implementation as we can see in Jeju and Seoul cases

☑ Making smart solutions connect energy efficiency to climate actions for carbon reduction

- Each sector of GHGs inventories like building, transportation, waste, etc. needs to establish reliable system that monitors energy production, consumption, and mix, and carbon emission
- Such system can be developed by smart technologies such as digital twins, AI, etc.



KEPCO(Korea Electric Power Corporation)

- Create AMI(Advanced Metering Infrastructure) with AI technology
- Conduct pilot projects that apply created AMI system in apartments
- Plan to test and make AMI system settled for public use
- Continue to further research and development on HEMS, BEMS



Thank you!



The List of Cited Materials

Page 2 : Smart City Challenge Project

<https://smartcity.go.kr/en/%EC%A0%95%EC%B1%85/%EC%A0%95%EC%B1%85%EC%82%AC%EC%97%85/%EC%8A%A4%EB%A7%88%ED%8A%B8-%EC%B1%8C%EB%A6%B0%EC%A7%80/>

Page 3 : Carbon Neutral Green City Project

<https://www.korea.kr/news/pressReleaseView.do?newsId=156505064>

Page 4 to 8 : Jeju Smart Challenge Proposal

https://smartcity.go.kr/wp-content/uploads/2019/08/%EC%A0%9C%EC%A3%BC-%EC%8A%A4%EB%A7%88%ED%8A%B8%EC%8B%9C%ED%8B%B0-%EC%B1%8C%EB%A6%B0%EC%A7%80_%EB%B0%9C%ED%91%9C%EC%9E%90%EB%A3%8C.pdf

Page 9 : Seoul “Energy Innovation District, Yangcheon-gu”

<https://smartcity.go.kr/en/2021/07/30/%EC%84%9C%EC%9A%B8%EC%8B%9C-%EC%98%A8%EC%8B%A4%EA%B0%80%EC%8A%A4-%EC%A7%91%EC%A4%91%EA%B0%90%EC%B6%95-%EC%97%90%EB%84%88%EC%A7%80%ED%98%81%EC%8B%A0%EC%A7%80%EA%B5%AC-%EC%96%91%EC%B2%9C%EA%B5%AC/>
http://ecpi.or.kr/epbrd/bbs/board.php?bo_table=bbs16&wr_id=110832&page=0

Page 10 : Seoul Energy Information Platform

<https://energyinfo.seoul.go.kr/tems/dashboard/engyTransStatus.do>

Page 11 : KEPCO project

<http://www.aitimes.com/news/articleView.html?idxno=143205>