

資料3 国際シンポジウム資料

（財）福岡アジア都市研究所 平成23年度第10回都市セミナー・国際シンポジウム 「福岡市の低炭素都市形成への提言とアジア都市の事例」

開催日時：平成24年3月22日（木）13:30～16:30

会場：アクロス福岡 4階 国際会議場

プログラム：

- 【開会挨拶】 （財）福岡アジア都市研究所 理事長 安浦 寛人
- 【報告】 「福岡市における低炭素都市形成に向けて」
（財）福岡アジア都市研究所 研究主査 天野 宏欣
- 【事例紹介1】 「1000 Singapores A Model of a Compact City」
シンガポール国立大学建築学部准教授 Erik Gerard L'Heureux 氏
同准教授 Florian Benjamin Schaetz 氏
- 【事例紹介2】 「ソウル市の公共交通改革」
嘉泉大学校 都市計画造景学府 教授 金 炯喆 氏
- 【事例紹介3】 「都市の自然エネルギー戦略と 3.11 後の変化」
認定 NPO 法人環境エネルギー政策研究所[ISEP]
主任研究員 山下 紀明 氏
- 【Q&Aセッション】 <パネリスト> （※順不同）
シンガポール国立大学 建築学部 准教授 Erik Gerard L'Heureux 氏
シンガポール国立大学 建築学部 准教授 Florian Benjamin Schaetz 氏
嘉泉大学校 都市計画造景学府 教授 金炯喆 氏
認定 NPO 法人環境エネルギー政策研究所主任研究員 山下紀明 氏
財団法人福岡アジア都市研究所 研究主査 天野宏欣
<モデレーター>

プライスウォーターハウスクーパース株式会社 シニアアソシエイト石丸修平

主催：財団法人福岡アジア都市研究所、福岡市 後援：社団法人九州経済連合会

登壇者（登壇順）：

天野 宏欣（あまの ひろやす）
財団法人福岡アジア都市研究所 研究主査
2000年九州大学総合理工学研究科大気海洋環境システム学専攻修了。同年（株）野村総合研究所入社。国土環境コンサルティング部、アジア・中国事業コンサルティング部を経て、2005年野村総研（上海）諮詢有限公司出向、2008年野村総研台北支店出向。2009年10月より現職。専門は主に中国・台湾における環境政策、地域計画、日本企業の進出戦略等。

Erik Gerard L'Heureux (エリック ジェラルド ルヴロー) シンガポール国立大学 建築学部 准教授 1973 年アメリカ生。プリンストン大学建築学修士課程修了。教育家 兼 建築家。建築デザイン作品は AIA ニューヨーク建築デザイン賞(2012 年)やシンガポール大統領デザイン賞(2011 年) 他を受賞し、2010 年の「ヴェネチア・ビエンナーレ国際建築展」ではシンガポール館「1000Shingapores」の共同キュレーターも務めた。著書に『Probing Hydrological Urbanism: Singapore/Cambodia』(2011 年) など。研究分野は、都市ユートピア構想、東南アジアの都市形態、水文学等。
Florian Benjamin Schaetz (フローリアン ベンジャミン シェッツ) シンガポール国立大学 建築学部 准教授 2000 年ストラスクライド大学 AAD 修了。建築デザインやコンサルティングの業務を多数手がけ、2008 年には建築設計施工会社「FACE2050」をドイツで設立。2010 年の「ヴェネチア・ビエンナーレ国際建築展」では L'Heureux 氏と共に共同キュレーターを務めた。受賞は香港アジアデザイン優秀賞(2009 年) 他、著書に『Abstractions 1/2 and Projections 2/2』『Fes reborn - a project on an ancient City』(共に 2011 年) 他がある。専門分野は観光向け建築デザイン、航空産業における複合保管システム。
金 炯喆 (キム ヒョンチョル) 嘉泉大学校 都市計画造景学府 教授 1987 年延世大学校大学院都市計画専攻博士課程修了(工学博士)。1983 年大地総合技術工事都市計画部課長、1984 年製図総合技術工事都市計画部課長、京機大や延世大他の講師を歴任後、1985 年より現職。1998 年佐賀大学、2005 年大分大学へそれぞれ客員研究経験あり。韓国国土海洋部中央交通影響審議会委員、ソウル市投資評価委員会委員ほか要職多数。専門は主に交通、駐車、交通環境(大気・騒音)、持続可能な交通等。
山下 紀明(やました のりあき) 認定 NPO 法人環境エネルギー政策研究所 主任研究員 2003 年京都大学工学部卒業。2005 年京都大学地球環境学大学院環境マネジメント専攻修士課程修了(地球環境学修士)。 2005 年春から環境エネルギー政策研究所研究員として持続可能なエネルギー政策の研究を進めており、特に東京、横浜、北九州などの地方自治体との協働を多く行う。 2010 年からベルリン自由大学政治科学研究科博士課程(環境政策研究センター所属)。
石丸 修平 (いしまる しゅうへい) プライスウォーターハウスクーパース株式会社[PwC] シニアアソシエイト 2002 年専修大学法学部卒業。2004 年に経済産業省に入省し、大臣官房政策評価広報課、中小企業庁長官官房参事官付、経営支援部経営支援課、長官官房制度審議室を経て、2007 年にプライスウォーターハウスクーパース株式会社入社。公共事業部を経て、ファイナンス&アカウティングソリューション所属(現職)。財団法人福岡アジア都市研究所研究員(非常勤)。

DESIGN
OF THE YEAR

1000
SINGAPORES –
A MODEL OF THE
COMPACT CITY

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1000 SINGAPORES –
A MODEL OF THE COMPACT CITY

JURY
CITATION

CURATORIAL AND DESIGN TEAM:
Khoo Peng Beng,
Head Curator
Belinda Huang Wen Jing Agnes,
Curator
Assistant Prof Erik G. L'Heureux,
Curator and Designer
Assistant Prof Florian Schaeitz,
Curator and Designer

DIAGRAMS AND CONCEPTS:
'Exuberant Singapore'
Thesis Studio 2009/2010
Assistant Prof Erik G. L'Heureux
Diong Fuihan
Kenneth Koh Cibaio
Luo Bo Yan
Ma Xiao
Yang Han

ADDITIONAL DIAGRAMS AND PHOTOS:
Owen Lam
Prime Tambayong
Wong Rouwian

WITH ASSISTANCE:
Lee Huihan
Chen Kah Wee
Chen Yanyl
Kao Shu Lian Konnie
Quek Li-En
Wu Hui Siang
Tan Yong Shen
Duc Duy Nguyen Hoang

COLOUR PHOTOGRAPHS
Jing Quek

IDENTITY AND GRAPHIC DESIGN:
H55
Hanson Ho, Creative Director

WEBSITE DESIGN:
Plate Interactive Pte Ltd
Sean Lam, Creative Director
Jason Chan, Designer/Developer

COMMISSIONED BY:
DesignSingapore Council
Singapore Institute of Architects (SIA)

CONTRACTOR:
Kingsmen Exhibits Pte Ltd

'1000 Singapore – A Model of the Compact City' addressed the theme of the 2010 International Architecture Exhibition (La Biennale di Venezia) which was *People meet in architecture*, and the Jury feels it was executed in a very Singaporean way.

The design team understood from past experience that successful pavilions at Biennales were those which worked with a very singular idea. Following this observation, they developed a range of detailed concepts to showcase how Singapore's urban life operates at many levels, from simple to complex.

They worked from using the traditional Singapore breeze block as a building material to create a pavilion that presented a range of ideas about living in Singapore and the country's housing model as a paradigm for the world.

The choice of a linear model, which is a slice through Singapore, was a very original one which demonstrated the good balance between development density and open spaces as a model for the city. It also incorporated the notion of community housing and sustainability: it explained that 83 per cent of the public housing was built by the government, but owned by the people so that they felt a strong sense of ownership and took pride in their way of life.

Additionally, the introduction of 1000 postcards in the exhibition celebrated the ordinary life in this city. They were not tourist postcards, but were diverse, humorous, and full of humanity, capturing the essence of Singapore.

These elements all came together as a very complete, elegant and fluent piece of exhibition design that was highly regarded by its many visitors.

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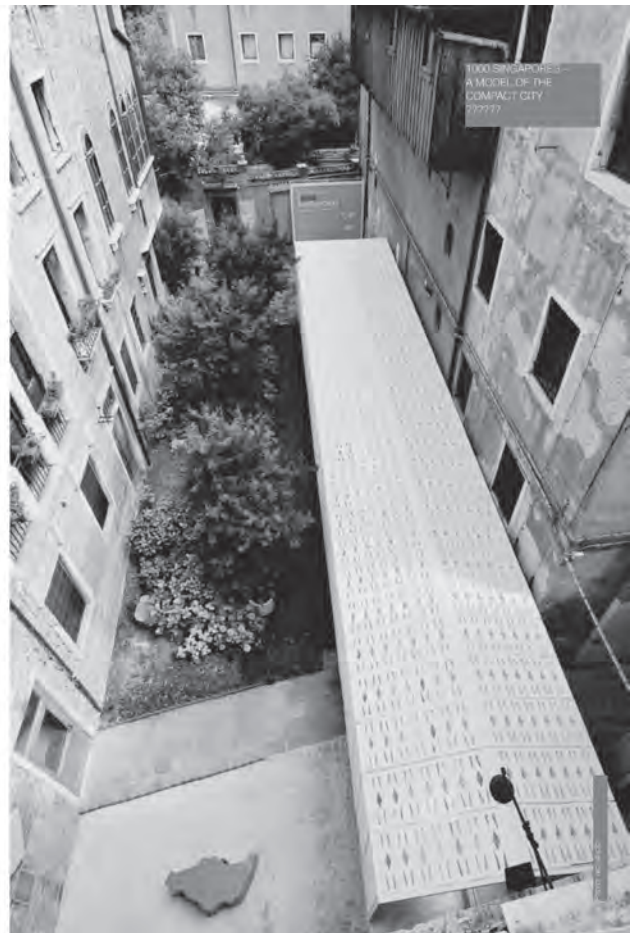
"The design is a compact yet multifaceted representation of Singapore. The exhibition's simplicity and clarity reasserts the power of architecture and design to communicate important ideas about the world we live in."

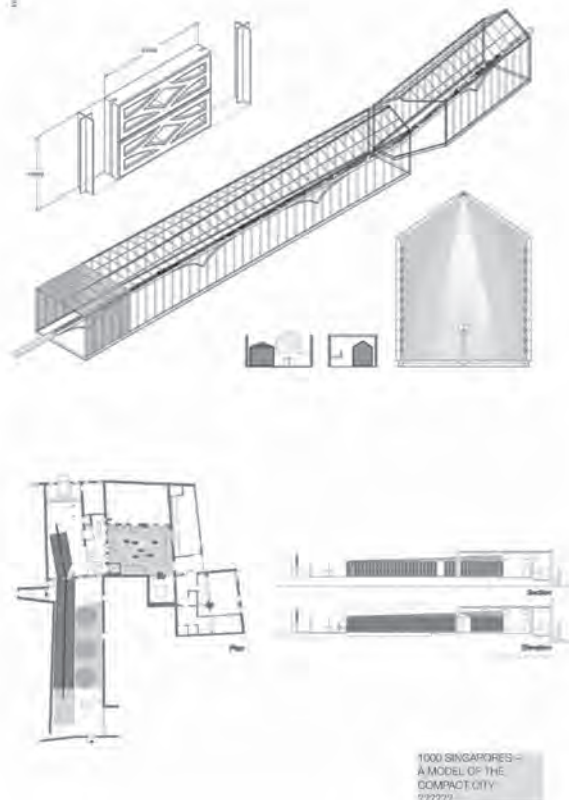
DESIGN TEAM
1000 SINGAPORES –
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177777

NOMINATOR &
REFEREE CITATIONS

NOMINATOR:
LAURENCE LIEW

CHAIRMAN
SIA AWARDS COMMITTEE

"1000 Singapore can house the world's population using only 0.5 per cent of the Earth's land area."

1000 Singapore is a powerful example of how design can touch the heart and provoke the mind while communicating a very important message. This exhibition was Singapore's contribution to the 12th International Architecture Exhibition (*La Biennale di Venezia*), "People meet in architecture", directed by Kazuyo Sejima. Focusing on Singapore's urban planning, with an emphasis on the scalability of the new towns and its high-rise, high-density housing, the project positions the country as a model of the compact city. The city is planned for 6.5 million people; multiplied a 1000 times, one could in theory house the world's population of 6.5 billion people in a space equivalent to 0.5 per cent of the world's land area. This was the provocative idea the curatorial team put forward through their beautifully designed pavilion, book and website. *Monocle* magazine noted the project was "...one of the Biennale's highlights, expertly curated..."

The curatorial team captured the visitor's attention and imagination with a clear and simple exhibition design that looks at Singapore's multi-faceted planning and organisation. The many complex ideas surrounding the planning of Singapore were

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taken together to create an experience that was informative and focused. The calm setting also allowed the visitors to focus on the many ideas presented. Though the presentation was broad, it was extremely specific in its design. A stimulating visual journey that allowed the visitor to imagine and form his or her own impression of the Singapore model was created.

Central to the exhibition was a 1:1000 scale model of a section through Singapore. Metaphorically, 1000 Singapore exported a slice of this city to help visitors visualise how 6.5 million people can be housed in just 710 square kilometres. Surrounding the model were beautiful photographs of the urban landscape along this strip of Singapore. 1000 black and white images showcased the form of the architectural and urban variety, sufficiently abstract to draw one's attention to the quality of the urban landscape. Moments of colour were distributed throughout the exhibition, rendering different groups of people in 'family' portraits-like poses that presented the different urban settings in Singapore. Examples are a group of cyclists, a team of grass cutters and a class of students. These were sprinkled as counterpoints to the black and white images. Juxtaposed against the photographs and sectional model were also various architectural

diagrams elaborating on the scale and the organisation of Singapore's landscape. All the information was presented in graphic form instead of text, allowing a clear and direct communication with the visitors.

Placed strategically in the context of a historic building, the pavilion complemented the setting as a beautiful architectural object. A linear tube made up of lightweight blocks transformed gradually, from a rectangle to a shape reminiscent of the archetypal pitched roof house. Symbolically, this alludes to a transformation from the high-rise housing blocks to single unit houses. The components of the tube were an abstraction of the ventilation blocks found in Singapore's conservation houses, and throughout Southeast Asia.

The exhibition's graphic design was powerful in its simplicity. The world map was utilised as its design motif, while the red dot referenced Singapore. The light blue background provided a foil to the more abstract architectural presentation of the pavilion, which included geography, maps and cartography.

A highly crafted and exquisite book complemented the exhibition. This compendium of essays, images, photographs, and diagrams, allowed

visitors to examine the exhibition up close. The book also provided in-depth explanations, commentaries and critiques on various facets of Singapore and its proposition to house the entire world's population in such a small land area.

The website, as an extension of the exhibition, took the cue from the pavilion's organisation. It provided detailed references that were precisely located where the diagrams and photographs were found in the actual exhibition. This allowed the visitor to travel along and explore the long slice of Singapore virtually. The website thus became the 1000 Singapore's digital gallery, accessible anytime, anywhere. By sliding along the axonometric drawing of the slice of Singapore, one could get a more detailed visual experience of the photographs and diagrams pertaining to that area.

The exhibition's three components — the pavilion, book and website — presented the subject matter in different forms. Each exploited its unique capability to communicate at varying degrees of detail. This created multiple levels of interpretation and ways to experience 1000 Singapore. The visitors were then prompted to give their feedback and thoughts at the pavilion and through its Facebook page. The entire

exhibition thus acquired a sense that the model is not static, but a dynamic one, being a work in progress.

The team that designed and curated 1000 Singapore is an example of how great collaborations in design can produce well thought out works that are highly sophisticated and refined. The design of the pavilion, graphics, book and website coalesced wonderfully into a single presentation that was at once simple and profound. While the exhibit set a high level of intellectual depth, the presentation gave a sense of quietude and humility. At first glance, 1000 Singapore might seem audacious, but on closer inspection, it is a compelling idea that points to sustainability, settlement patterns, and the practices of human occupation. It is a discussion about all manners of footprints — not only the size of our cities, but also carbon footprints, chemical footprints, ecological footprints, economic footprints, etc.

The power of the design is in its simplicity and clarity. To distil from an explosion of information into one statement. To take that statement from the smallest scale to the largest scale, and back. From the local to the global. From the abstract to the literal. And finally, to invite one to reflect, share and discuss.

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REFEREE:
ASHVINKUMAR S/O KANTILAL

PRESIDENT
SINGAPORE INSTITUTE OF ARCHITECTS

A one thousand scale sectional model cutting right through the entire island of Singapore. A thousand images of abstract diagrams and photographs, peppered with saturated colour portraits of people in architecture. A single architectural tube whose section transforms from a rectangle to the archetypal pitch roof form. A 'thousand' ventilation blocks making up the tube. The dialogue between a brilliant architectural intervention and an old Venetian courtyard.

A beautifully provocative contribution by Singapore to the theme of the 12th International Architecture Exhibition (*La Biennale di Venezia*), "People meet in architecture".

When I first experienced the site where the pavilion would be finally installed, I was enthralled by the patina of age of the space. There was a contemplative quality to the site, a kind of silence that was an oasis. The site is unusual for an exhibition, comprising multiple courtyards and rooms. It was challenging. When I first heard the team's presentation, I sensed immediately that the clarity and simplicity of the concept would make a powerful design statement.

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When I finally visited the completed project, it turned out to be an amazing experience, more than I had imagined. The architectural move was respectful of the old, yet held its own within the Venetian vernacular. It was silent and peaceful — special in a rather crowded Venice Biennale. It spoke of diversity, yet had an orderliness, a discipline that was befitting the subject matter; that of a meta-project to house a nation. It was provocative in its message: that perhaps human beings could touch the earth more lightly. Yet, the pavilion was never didactic, it had an openness in its attitude that invited people to share and discuss potentials and possibilities. I especially liked the thought that our work in Singapore to build a compact city is now placed squarely in the discussion on sustainability and urbanisation. The pavilion is a compelling example of how design can be poetic and powerful without resorting to the verbose or be entangled in an overly complicated matter. The different elements in the pavilion came together in an honest and considered way, each design cleverly referenced the other. And it is through this that the design communicates the urban landscape of Singapore to the visitors. I read many of the comments left by our visitors and how they were touched by the 1000 Singapore

pavilion. Many claimed that it was the best of the entire Venice Biennale. Many more wanted to visit Singapore after seeing the pavilion. One German architectural scholar even came to Singapore and travelled along the entire sectional cut of the model to experience it for himself: to see first-hand the images that were presented in the pavilion. I feel that the pavilion's design, complete with beautiful architectural drawings and photographs, and an amazing book and website, was transformative. More than just transforming the site, the pavilion also changed perceptions of Singapore as a city and a nation. It gave Singapore a new voice, a new relevance in the world of design and sustainability. Its design also transformed how Singaporeans viewed itself. It anchored the work of architects, urban planners and designers in Singapore to a simple, but imaginative idea. I always hold the belief that we should plan for seven generations. In this regard, I am extremely proud to be a referee for the 1000 Singapore pavilion as it is an intelligent and heartfelt call for us to look at how we can all continue to be more compact in our footprint on earth, and perhaps leave it a better place for our future generations.

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REFEREE:
DR WONG YUNN CHII

HEAD OF DEPARTMENT
OF ARCHITECTURE
NATIONAL UNIVERSITY OF SINGAPORE

This project should be commended with a President's Design Award for two reasons. Firstly, for its design ingenuity and innovation. Secondly, for the value and direction it represented Singapore on a prestigious international platform. 1000 Singapores was a very successful and complete artwork — in concept, media presentation, book publication, and architectural design — that embodied Singapore's idea of living and urban model at the 12th International Architecture Exhibition (*La Biennale di Venezia*) in 2010.

The Biennale was curated by Kazuyo Sejima under the theme "People meet in architecture". Singapore's contribution gave a provocative and sophisticated interpretation, as an opportunity for a future model of the world where people meet by living, working and playing.

A model of the compact city cuts to the heart of the theme, illustrating the positive implications of the dense city, and how this translates to the most sustainable urban form for the future. And, of all nations, Singapore does have something important to say on how human beings can comfortably live in a compact space. It is a feat of not only modern architecture, but also of town planning and social policy.

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The motif of the exhibition was a single 35-metre sample slice of Singapore's densely populated heartlands, which cuts the island state from east to west. Two NUS academics and two of the university's former architecture graduates made a compelling and provocative case of how sustainable the world's population can be — if it was fashioned after this country's housing and urban infrastructure. The exhibition's design showcased how we design and approach our environment. A piece of Singapore was brought to Venice, and it was housed in a long tube with ventilation blocks whose form referenced both public and private housing. The idea and the architecture gave an overall impression of simplicity and directness. As a removable and recyclable exhibition, even the mathematical cutting-and-slicing was presented in uncomplicated terms. This not only sets forth the considered relationship of design activities and approaches to the environment, but also how it is innovative, provocative and stimulating.

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It is my pleasure to announce that the design team was supported by six fresh graduates and eight undergraduates from the design studio of Assistant Professor Erik L'Heureux and Assistant Professor Florian Schaez. Both academics had the support of peers from the NUS Department of Architecture and their work was built upon our department's research on Singapore. It culminated in an over 350-page compilation featuring a series of photographs and 200 diagrams and drawings that complemented the exhibition.

It is my honour to recommend 1000 Singapores as an important entry for the President's Design Award. It was a very successful contribution to our nation's design performance, an achievement that was discussed and recognised by the international media like *The New York Times*, *Wallpaper**, and *Monocle*.

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1000 Singapore – A Model of the Compact City

This exhibition represented Singapore at the 12th International Architecture Exhibition (La Biennale di Venezia) held between 29 August to 21 November 2010 in Venice, Italy. It was conceptualised and created by a multidisciplinary team for the DesignSingapore Council and the Singapore Institute of Architects (SIA).

In response to exhibition curator Kazuyo Sejima's theme, "People meet in architecture", the team decided to showcase Singapore as a model of a compact city, claiming that "1000 Singaporeans can house the entire world's population using only 0.5 per cent of the Earth's land area".

"We wanted the exhibition to be a thought model. To imagine and think through novel ideas of densities, inhabitation, architecture, planning, ecology and environment, and how settlement patterns impact the world we live in," says the design team.

1000 Singaporeans put together a thousand architectural diagrams and images around a 30-metres long scaled model of a section through the length of Singapore from west to east. This showcased the city-state's people and its varied urban landscape, including industrial estates, public housing, financial district and nature reserves. The images and the model were housed in a tube made up of a thousand components inspired by the vernacular ventilation blocks found in

traditional shophouses. The tube begins as a rectangle and changes into a profile of a house with a pitched roof, corresponding to Singapore's public to private housing ratio of 83 per cent to 17 per cent. A book and an interactive website were also created to complement the exhibition.

The overall design aimed to showcase Singapore in a calm, academic manner, yet highly accessible to a larger audience. The presentation mode was also deliberately kept analogue, instead of making use of digital technology. The design team explains: "This choice of presentation style is by design, in counterpoint to the often loud, technologically exuberant exhibitions that seemingly obscure the complexities of the topics at hand in similar venues."

Its biggest challenge in designing this exhibition was the short time-frame. It was fortunate that its members were "passionate, diligent and committed" to see this project come to fruition in just a matter of weeks. To aid the process, the team made use of existing research done by the staff of the National University of Singapore (NUS) and also enlisted the help of its students. "In some ways, time forced us to be extremely focused, direct, and clear," says the team. "Without which, the exhibition would have never made it to Europe."

Another challenge was figuring out how to ship the exhibition to a relatively restricted site — a renaissance palazzo in Venice. The

team used the limitations in dimensions and weight as references for its design. For example, using the floor-to-ceiling height of a typical public housing interior helped create a modular dimension that would fit into a shipping container. The custom ventilation block was also crafted out of a lightweight recyclable material so it could be easily moved around, and allowing the exhibition to return to Singapore to be recycled.

The project would not have been successful without the collaborative spirit of its clients and their constant feedback. "As an experiment of thoughts, 1000 Singaporeans was direct, bold, and might even be misunderstood," they say. "However, with the support of, and the in-depth discussions and feedback from NUS, DesignSingapore Council, SIA, Housing & Development Board and the Urban Redevelopment Authority, we were able to test and refine the exhibition direction and make it accessible to an international audience."

The team would also like to add that 1000 Singaporeans was inspired by the city-state's many layers and faces, an attribute unique to it. "Singapore is full of places, things and ideas, many of which are hidden, requiring exploration, curiosity, and thinking," they say. "This sense of discovery and uncovering is a wonderful value Singapore possesses; it is where 'people really meet in architecture'."

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About the Designer

The design team is made up of a group of architects, professors, designers, photographers, and students.

The curatorial team was led by a cosmopolitan mix of professionals in Singapore. Malaysian-born architect Khoo Peng Beng, and Singapore architect Belinda Huang run arc studio architecture + urbanism. They were the recipient of the 2010 President Design Award - Design of the Year for its public housing project, The Pinnacle@Duxton.

From NUS's Department of Architecture are Assistant Professor Erik G. L'Heureux and Assistant Professor, Florian Schaez. Professor L'Heureux, an American architect, researches hydrology, density, and urban form in Asia while coordinating the second year architecture design curriculum. Professor Schaez, a German architect, examines materiality, technology, and develops new solutions for eco-resorts and the aviation industry while running the first year architecture design course.

Advice for emerging designers:

"To understand the world, one must understand home. Often, we find young students and designers wanting to look only outside of Singapore for inspiration. However, looking inside our own city, community, and maybe even flats, while thinking critically, and reflecting carefully, young emerging designers can find amazing ideas and inspiration right here at home. We believe that curiosity is key to empower the next generation of young, emerging designers, and curiosity begins at home. This is the spirit of 1000 Singapore."

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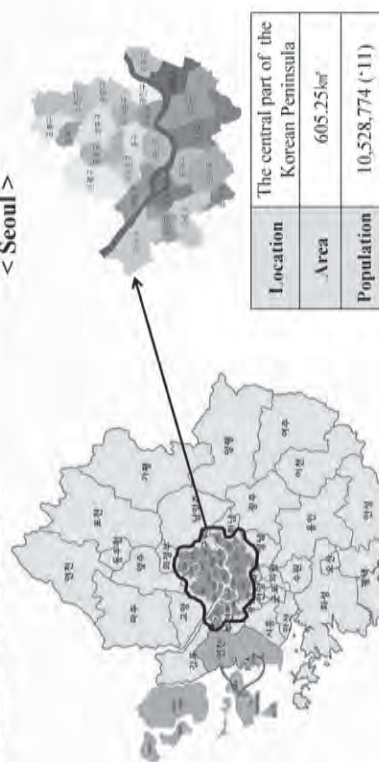
Public Transportation Reforms in Seoul

Hyung Chul KIM

Department of Urban planning, Gachon University
Korea

Year 2004 BRT(Bus Rapid Transit) System

* Where is the Seoul?



Hyung Chul KIM, Department of Urban Planning, Gachon University, Korea

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 - I. New Bus System
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 - III. BIS (Bus Information System)
 - IV. Bus Transfer Center
 - V. Semi-public System
 - VI. Integrated transfer fare system
 - VII. Effects & Benefits
- Year 2011 New Transportation Strategy of Seoul

Hyung Chul KIM, Department of Urban Planning, Gachon University, Korea

Bus System Before 2004

* How was the bus system before 2004?

3 Type of buses			
Number System	Non - systematical		
Bus Route	• Long distance : Increased time intervals between buses • Curved bus line : Increased travel time • Duplicated bus line : Low quality service to citizen		

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I. New Bus System

* How change?



- 4 type of buses
 - Blue, Green, Yellow, Red bus
- New bus number System
- Over 400 express and residential buses and 8,500 city buses (2004)

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Type of Buses

2. Green bus	Feature	Number System
 Green Bus	• Connect residential areas, subway lines and bus terminals • Controlled by private companies	• Four-digit numbering system : Departure area + Arrival area + Double-digit serial number

<Bus Service Route>



◀ Ex) 3317 Bus
: Macheon-dong ↔ Jamsil station

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Type of Buses

1. Blue bus	Feature	Number System
 Blue Bus	• Connect suburban areas to downtown Seoul • Controlled, in part, by the City of Seoul • Higher speeds and longer distances	• Three-digit numbering system : Departure area + Arrival area + Single-digit number

<Bus Service Route>



◀ Ex) 462 Bus
: Songpa bus garage ↔ Yeongdeungpo-gu

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Type of Buses

3. Yellow bus	Feature	Number System
 Yellow Bus	• Circle downtown Seoul • Make short stops at major tourist, shopping and business areas around the center of the city	• Two-digit numbering system : Area number + Serial

<Bus Service Route>



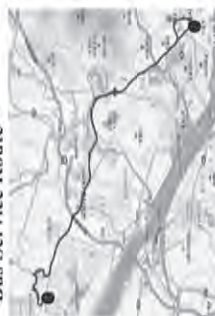
◀ Ex) 03 Bus
: Namsan Seoul Tower ↔ Namsan Seoul Tower

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Type of Buses

4. Red bus	Feature	Number System
 Red Bus 	- The quickest of the group for wide area line - The most comfortable - Designed to seat every passenger on the bus - Come in various colors - Provide commuters with easy access to neighboring cities, such as Ilsan, Anyang.	four-digit numbering system : Red bus + Gyeonggi-do departure area + Double-digit serial number

<Bus Service Route>



◀ Ex) 9403 Bus
: Ilsan ↔ Seoul station

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Metropolitan area

- Area is divided with several districts or cities.



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Type of Buses

5. Maoul bus	Feature	Number System
 Maoul Bus	- Smaller community-based buses - Run shorter routes - Easy to spot - Due to their significantly smaller size in comparison to other buses.	<Example> - Gangnam 01, 02, 07 - Gangdong 01, 02, 05

<Bus Service Route>



◀ Ex) Gangdong 05 Bus
: Gangdong bus garage ↔ Chunho station

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II. Exclusive Bus Lane

- The arterial road
- Red exclusive bus lanes
- Bus lane is located on the center of the road.
- Speeds & On time departure improvement
 - Reduced travel time
- Mode choice of public transportation ↑
- Average speeds ↑
 - BRT : 51.5km/h
 - Light rail : 26.9km/h
- Increased passenger



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Exclusive Bus Lane



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Exclusive Bus Lane

- * Development of exclusive bus lane
- Dramatically increased (7.6km → 100.4km)
- Improved road Capacity & speed - up

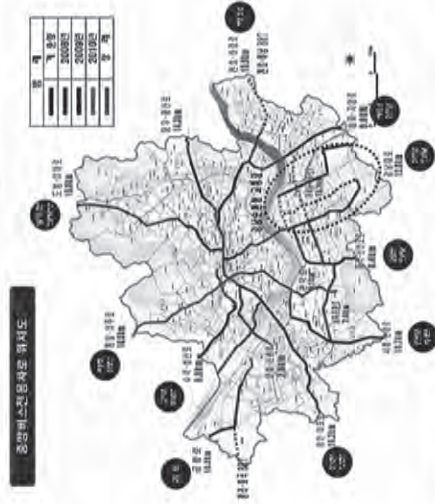
Change of exclusive bus lane



2003년 2004년 2005년 2006년 2007년 2008년 2009년 2010년

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Exclusive Bus Lane Route Map



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III. BIS (Bus Information System)



For TV

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BIS (Bus Information System)



◀ For smart phone application

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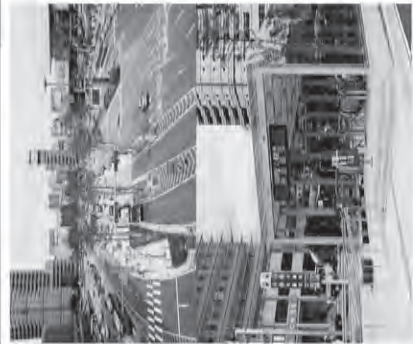
VI. Bus Transfer Center

• Connection of Railroad station & Subway

• Constructing 5 centers

• Bus Line

- More regional line
- More numerous & various line



▲ Seoul Station Bus Transfer Center

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BIS (Bus Information System)



▲ For bus stop

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VI. Bus Transfer Center



▲ Cheonggyangni Bus Transfer Center



▲ Yoido Bus Transfer Center

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V. Semi - public Bus System

- For non - profit lines with subsidizing
- Making new 94 lines for low public transportation accessibility region

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Entering the Gate

<Different type of gate>



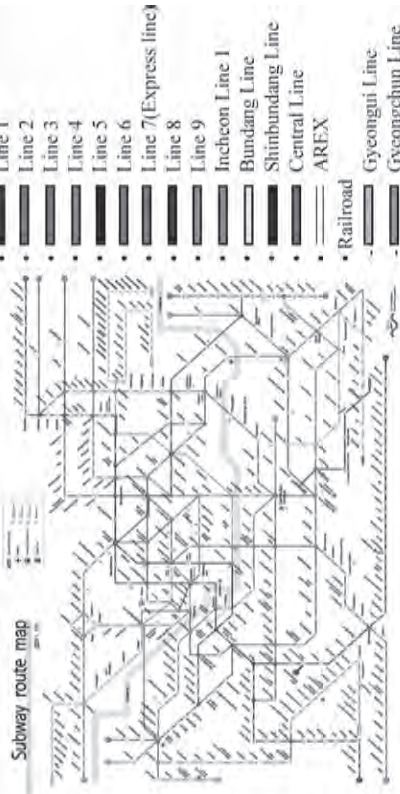
(The gate is changed for convenient use.)

- Make sure that you know the direction to your destination
 - Before you get off the train and pass through the gates in the right direction.
- If you are traveling with a transit card instead, simply tag the card on top of the sensor.
- Check gates carefully
- Be sure to take the returned ticket with you
 - So that you can use it to pass through the gates at the arrival station.

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VI. Integrated Transfer Fare System

* 16 kinds of color-coded subway lines



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How to Transfer

- Check your destination prior to boarding the train
- Check the line that you need to transfer to and the right direction
 - Easily get to the platform for the transfer station
 - By following the signs marked as "Transfer".
- Make your transfer without having to pass through the gates
 - So do not need to buy a separate ticket for transfer purposes.



Line 9 transfer gate

- In case of Line 9 transfer gate, there is no extra charge.

<The signs "Transfer">



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Fare System

* Metropolitan Integrated Fare

- 2007. 7.1 : Connection of Seoul – Gyeonggi-do – KORAIL
⇒ Metropolitan Utility Fare system start 'between Bus and Subway'

- Before : Pay basic charge whenever you transfer
⇒ Now : Pay charge as 'the distance traveled'

- Application of Metropolitan Integrates Fare
⇒ In case of using 'transportation card'



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Fare Guide (Distance Scale Rate)

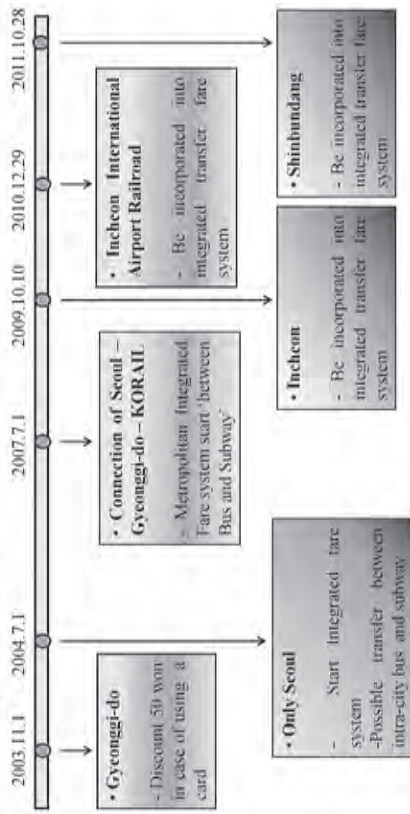
* When travelling by subway only : 900 won → 1,050 won (2012. 2. 25)

Category	Card	Ticket
General	* Basic Fare: 1,050 won until 10km * Additional Fare - 10 ~ 40km : plus 100 won per 5km - 40km ~ : plus 100 won per 10km	Plus 100 won from card fare
	Basic Fare(1,050won) minus 150won and 20% additional discount (Basic Fare : 720won)	No discount
Teenagers (age 13-18)		
Children (age 6-12)	Basic Fare(1,050won) minus 150won and 50% additional discount (Basic Fare : 450won)	50% discount from regular ticket fare.

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History

* History of Integrated Transfer Fare System



Fare Guide (Distance Scale Rate)

* When transferring from subway to bus

When Transferring to a Bus (Combined Distance Scale Rate for Public Transportations)	Basic Fare * The higher basic fare from the two means of transportation will be charged.	Basic fare within 10km (Free Transfer)
	Plus Fare	Additional 100 won will be charged for every 5km after exceeding the first 10km.

• Applicable situations

: When transferring between Blue Bus, Green Bus, Yellow Bus, Local Bus & Subway
(Red Bus, Incheon Bus, and Gyeonggi Express Bus are included.)

• 5 ridings and within 30 minutes is free.

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Fare Guide

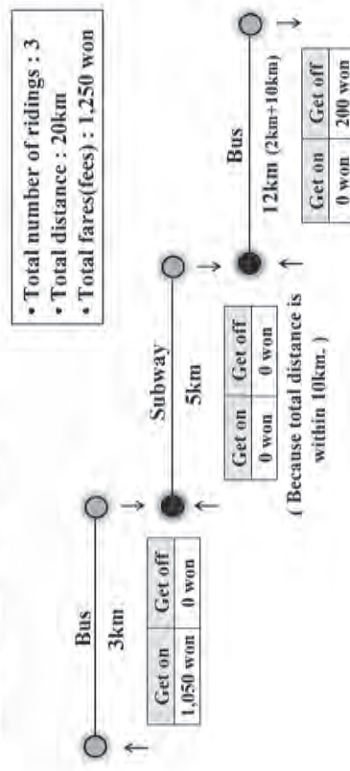
* Various Discount Privileges

Category	Discount(Bonus) Rate
Regular Ticket	Children between ages of 6-12 years old receive a 50% discount
Commuter Subway Card Exclusive and Others (14 Types)	Can be used up to 60 times within 30 days from the purchased date. (14 types ranging from 39,600 won to 89,800 won depending on distance)
Teenagers (age 13-19)	- Adult: Basic fare 900 won (up to 10km), No Discount - Teenagers (age 13-19): 20% of Regular Transportation Fare - Children (age 6-12): 50% of Regular Transportation Fare
Children (age 6-12)	- Adult: 20% of Regular Transportation Fare - Teenagers (age 13-19): 50% of Regular Transportation Fare - Children (age 6-12): 20% of Children's Transit Card Fare

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Fare Calculation example

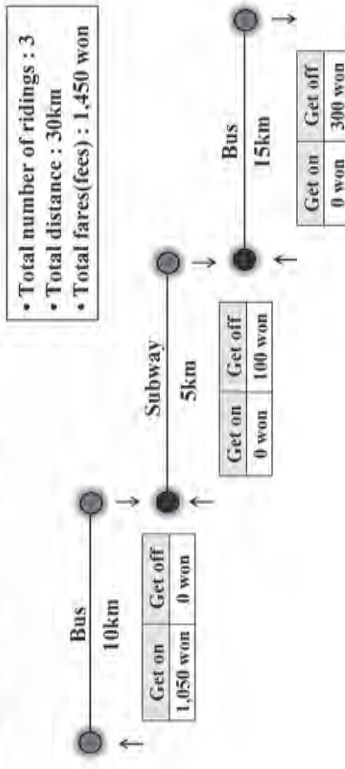
* Case 2 (● : Transfer spot)



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Fare Calculation example

* Case 1 (● : Transfer spot)

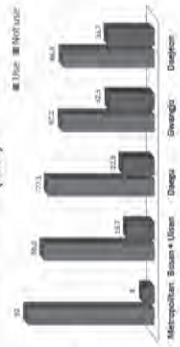


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Transportation card

- Tag a card when you take the bus or subway
 - If you don't tag a card when you get off, plus duplicated charge in case of transfer.
- A smart card
 - CPU chips & Wide Using Range & More smaller

Ratio of using a transportation card (2009)



- User of transportation card ↑
- Highest using area : Metropolitan (Seoul, Incheon, Gyeonggi-do)
- Convenient Transit

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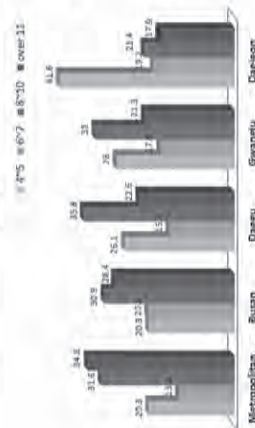
VII. Effects and Benefits

- Traffic accidents by bus 46.7% ↓
: 1947 ('04) → 1038 ('10)
- Citizen satisfaction to the bus 14.96% ↑
: 59.2% ('06) → 74.16% ('10)
- Fare savings by the integrated system
: 2.34 trillion won ('04 - '10)

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Effects and Benefits

How many use public transportation a week (2010)

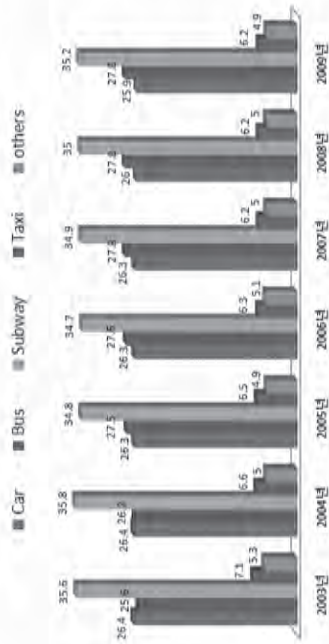


- People always use public transportation a day.
- Average using times a week
- Number of over 8 : average 59%
- Transportation system is getting gradually develop & convenient

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Effects and Benefits

Mode choice of Transportation a day in Seoul (%)



- Subway > Bus > Car > Taxi > Others

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Effects and Benefits

* Vitalization of public transportation (Nationwide)

- From 2001 to 2008, mode choice
 - Car : 16.7% ↓ (73.5% → 56.8%)
 - Bus : 10.5% ↑ (14.1% → 24.6%)
 - Subway & Railroad : 6.1% ↑ (9.8% → 15.9%)

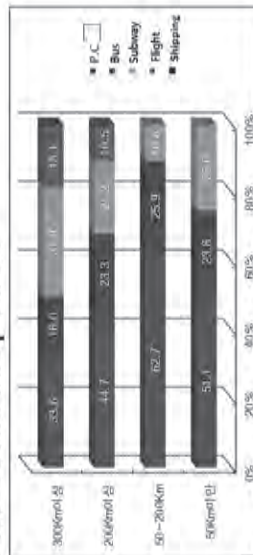


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Effects and Benefits

* Mode choice of transportation by distance (Nationwide)

- Increase of travel time : Use of passenger car ↓
- Movement of middle & long distance (200km ~ 300km)
 - More than half use transportation

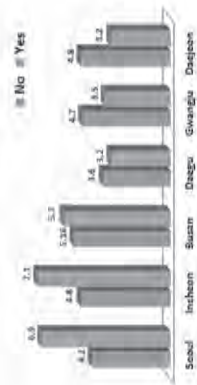


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Effects and Benefits

* Ratio of public transportation by exclusive bus lane

- Seoul, Incheon, Busan : Increased ↑
- Daegu, Gwangju, Daejeon : Decreased ↓
- This is based on the
 - Mode choice of public transportation
 - Fast and convenient service



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Effects and Benefits

* Case studies of exclusive bus lane

Hajeong-ro in Dongdaemun-gu, Seoul

- Traffic speeds ↑ 30%
 - Bus : 12.4km/h → 19.3km/h (↑ 55.6%)
 - Vehicle : 18.9km/h → 19.5km/h (↑ 3.2%)
- Improved road Capacity
- Reduced traffic congestion(traffic jam)

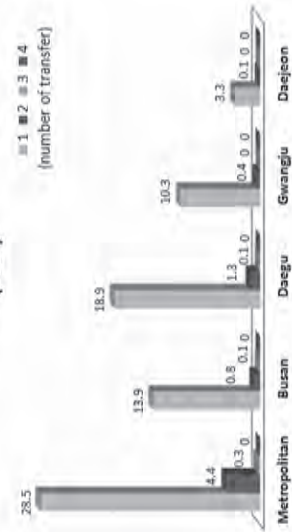


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Effects and Benefits

- Metropolitan area is highest to transfer.

How many transfer per a trip (2010)

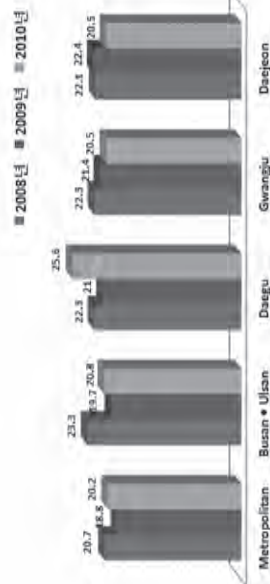


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Effects and Benefits

- Metropolitan area is lowest to transfer time.

Transfer time (min.)



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Projects

- Bus Semi – public System Improvement**
 - 456.7 billion Won Subsidy ('11)
- Public Transportation Transfer System Improvement**
 - Making 4 New Transfer Center & a P&R Parking facility
 - Subway Transfer Station Structure change
- Solving a Congestion Problem**
 - Bus Line Redistribution
 - Congested Subway Station Redesign

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2011 New transportation Strategy of Seoul

* Policy trend

Goal	Transportation Infra structure Construction	Public Transportation System stabilization	Citizen Oriented Transportation System
Period	1974 - 1999	2000 - 2011	2012~
Policy	- New Subway Network - Road Construction	- Exclusive Bus Lane - Public Transportation Integrated transfer fare	- For Safety & Transportation weak person - Transfer, Pedestrian & Car Parking Environment Improvement - Efficient Smart Transportation

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Projects

- TOD (Transit Oriented District)**
 - * Example) Yonsei-ro TOD
 - ▶ Section : Yonsei-ro (Sinchon Rotary ~ Front gate of Yonsei Uni.), 500M
 - ▶ Problem : Excessive vehicles & buses, High density of walk, Low quality of walk environment



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Projects

※ Example) Yonsei-ro TOD

▶ TOD Construction

- Reduction of lane & Widen walking space
- Permission of only bus traffic
- Street furniture & Culture program



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Projects

■ Bus Exclusive Lane Networking

- 105.5km (‘11.10) → 134.5km (‘14) : ↑ 29.0km

■ Wide – regional Urban Railroad Plan

- Under construction 4 line (91.8km)
- Planning 2 line (54.4km)
- Under considering 6 line (62.5km)

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都市セミナーシンポジウム
「福岡市の低炭素都市形成への提言とアジア都市の事例」
「都市の自然エネルギー戦略と3.11後の変化」

2012年3月22日
山下 紀明



Free University of Berlin
Environmental Policy Research Center (FRU)
特定非営利活動法人
環境エネルギー政策研究所 (ISEP)

活動紹介 持続可能なエネルギーシステムの提案

電力を選ぶ「グリーン電力プログラム」の促進、市民風車などの地域エネルギー自立を支援



みんなのグリーン電力
・自然エネルギーの電気の選択を支援

<http://www.greenpower.jp/>



市民風車
・市民出資による風車を支援
・北海道グリーンファンドとの協働



3

ISEPとは 活動領域と目的

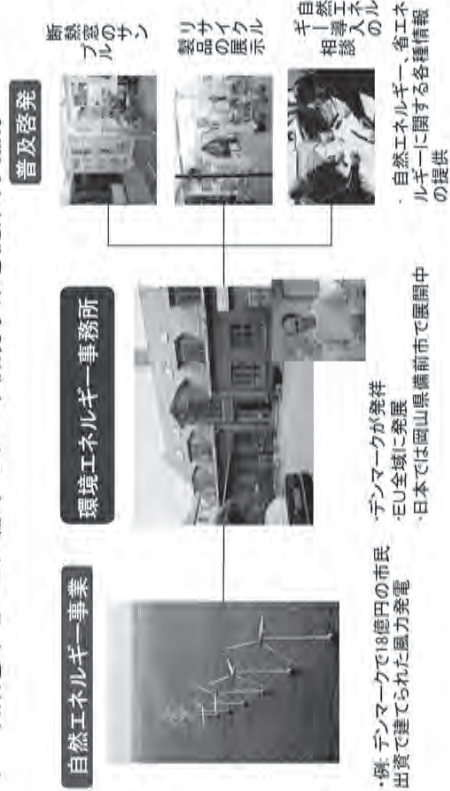
自然エネルギー、気候変動政策、エネルギー市場の適正化を主な活動領域とし、持続可能なエネルギー政策の実現を目指すNPO

所長：飯田哲也(いいたてつなり)



活動紹介 地域エネルギー事務所の推進

自治体や地元企業・NGOとの連携により、地域の持続可能なエネルギー政策を中心とした都市モデル、新規事業を提案、支援。



活動紹介 政策研究

各自然エネルギー団体や国際機関と連携した調査研究



自然エネルギー白書2011
・日本の自然エネルギー状況を網羅
・各自然エネルギー団体と連携
(2012版作成中)



自然エネルギー世界白書2011
・世界の自然エネルギー状況を網羅
・世界各国の研究機関と連携

自然エネルギー(再生可能エネルギー: Renewable Energy)

電気		熱利用		燃料
太陽	○	○	—	—
風力	○	—	—	—
バイオマス	○	○	○	○
地熱	○	○	—	—
小水力	○	—	—	—
海洋	○	—	—	—



- 1 都市の自然エネルギー政策とは
- 2 東京都の自然エネルギー政策
- 3 都市の力を活かす

3.11後の世論

多くの市民が減・脱原子力、自然エネルギー推進を求める

Q3. 将来的には、原子力発電所の数をどうすべきだと思いますか？

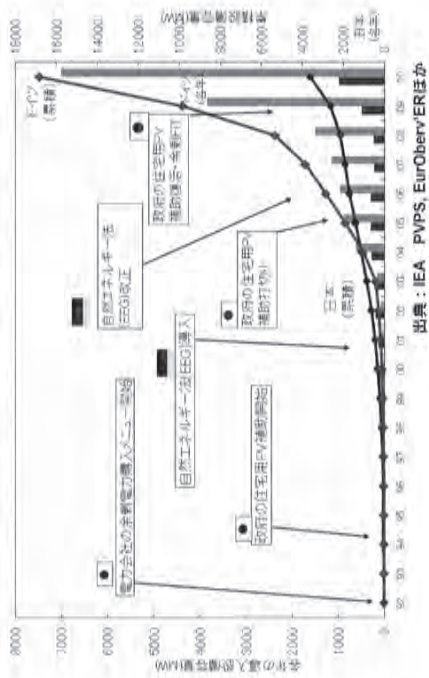


Q9. 今後発電に使うエネルギー源は、何を最も増やすべきだと思いますか？



太陽光の失敗の拡大

政策不在の中、2004年に単年度導入量でドイツに抜かれ、2006年に累積で抜かれ、その後メーカー生産量も抜かれた



9

固定価格買取制度の主な論点

1. エネルギー源別・規模別の長期間の適切な価格設定
1. 優先接続ルールの確立
2. 価格見直し時期
3. 調達価格等算定委員会をめぐる攻防
4. 神も悪魔も細部に宿る
 - ・ 内税か外税か
 - ・ 価格の適用時期
 - ・ 紛争調整期間の中立性

11

バイオマス・ニッポン総合戦略の失敗

214事業のほとんどが意味がなく、残りも期待された効果なし。情報も整備されておらず、少なくとも1300億円以上が無駄に。

- ・ 決算額が不明確
 - 確定できたものが57.0%で1374億円
 - 43.0%は決算額特定できず
- ・ ほとんどが効果なし
 - 効果が発現しているものは16.4%
 - ただし期待される効果は出ていない
 - 補助金の重複など非効率な例もあり
- ・ 情報整備は進まず
 - バイオマス原料の把握は16.7%
 - CO2収支の把握は2.3%



総務省HP「バイオマスの利活用に関する政策評価」 http://www.soumu.go.jp/menu_news/s-

10

自然エネルギー普及のために必要な国レベルの政策や制度

1. 長期的な高い数値目標、政治的なコミットメント
1. 透明で安定した市場を創る(固定価格制・発電電分離など)
2. 需要プルの視点で市場の障害を取り除く(水利権、地熱(温泉熱)利用、漁業権など、既存の権利関係の整理・統合など)
3. 化石燃料等への補助金を段階的に廃止し、外部コストを内部化(炭素税や電気料金上乗せなど)
4. 自然エネルギーの恩恵が地域へ入る市民参加・地域参加の仕組み(地域出資、市民ファンドや地域エネルギー事務所など)

12

地方自治体の自然エネルギー政策に関する世界白書



180の都市と地方自治体の中で、

目標値設定

・140以上が、自然エネルギーとCO2削減の両方、もしくはいずれかの目標値を持っている

都市計画 建築基準

・半数以上が、自然エネルギーに関連した都市計画を持ち、35以上が自然エネルギーに関連した建築基準や許可を持っている

インフラの運営

・90以上が、自らのインフラや行政に関連する政策を持っている

・草稿、08年9月アップデイト
・主筆、エリック・マーティノ
・REN21、ICLEIとの共同レポート

http://www.climate-ig.jp/TOLREC/rep_localgsr.html

13

京都の自然エネルギー導入義務化

日本で初めての義務化を京都府・市で2012年4月から施行。義務量は小さいものの国に先行し、他地域に波及の可能性大。

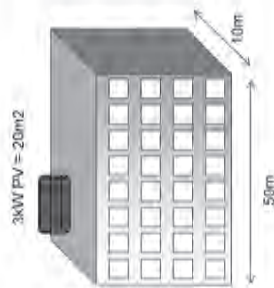
・大規模建築物への自然エネルギー導入義務化

・床面積2000m²以上の特定建築物が対象

- ・年間30件程度を想定
- ・京都市内の歴史的保護地区のみ対象外

・年間3万MJ相当の自然エネルギー導入

- ・太陽光なら3kW程度
- ・太陽熱やバイオマス熱利用も含む
- ・燃料電池は含まず



16

政策/取り組みの領域	取り組みの概要	政策/取り組みの概要
1. 目標設定	(a) CO2削減目標 (b) 都市のエネルギー消費量を削減するための目標 (c) 自然エネルギーの導入目標 (d) 自然エネルギーの導入目標 (e) 自然エネルギーの導入目標 (f) 自然エネルギーの導入目標 (g) 自然エネルギーの導入目標 (h) 自然エネルギーの導入目標 (i) 自然エネルギーの導入目標 (j) 自然エネルギーの導入目標	2. 法的責任と権限に基づく措置 (a) 自然エネルギーの導入目標 (b) 自然エネルギーの導入目標 (c) 自然エネルギーの導入目標 (d) 自然エネルギーの導入目標 (e) 自然エネルギーの導入目標 (f) 自然エネルギーの導入目標 (g) 自然エネルギーの導入目標 (h) 自然エネルギーの導入目標 (i) 自然エネルギーの導入目標 (j) 自然エネルギーの導入目標
3. 地方自治体によるインフラの整備	(a) 地方自治体は自然エネルギーを推進する役割を担う (b) 地方自治体は自然エネルギーを推進する役割を担う (c) 地方自治体は自然エネルギーを推進する役割を担う (d) 地方自治体は自然エネルギーを推進する役割を担う (e) 地方自治体は自然エネルギーを推進する役割を担う (f) 地方自治体は自然エネルギーを推進する役割を担う (g) 地方自治体は自然エネルギーを推進する役割を担う (h) 地方自治体は自然エネルギーを推進する役割を担う (i) 地方自治体は自然エネルギーを推進する役割を担う (j) 地方自治体は自然エネルギーを推進する役割を担う	4. 自主的取り組みと自治体の役割 (a) 地方自治体は自然エネルギーを推進する役割を担う (b) 地方自治体は自然エネルギーを推進する役割を担う (c) 地方自治体は自然エネルギーを推進する役割を担う (d) 地方自治体は自然エネルギーを推進する役割を担う (e) 地方自治体は自然エネルギーを推進する役割を担う (f) 地方自治体は自然エネルギーを推進する役割を担う (g) 地方自治体は自然エネルギーを推進する役割を担う (h) 地方自治体は自然エネルギーを推進する役割を担う (i) 地方自治体は自然エネルギーを推進する役割を担う (j) 地方自治体は自然エネルギーを推進する役割を担う
		5. 環境キャンペーン、普及啓発 (a) 地方自治体は自然エネルギーを推進する役割を担う (b) 地方自治体は自然エネルギーを推進する役割を担う (c) 地方自治体は自然エネルギーを推進する役割を担う (d) 地方自治体は自然エネルギーを推進する役割を担う (e) 地方自治体は自然エネルギーを推進する役割を担う (f) 地方自治体は自然エネルギーを推進する役割を担う (g) 地方自治体は自然エネルギーを推進する役割を担う (h) 地方自治体は自然エネルギーを推進する役割を担う (i) 地方自治体は自然エネルギーを推進する役割を担う (j) 地方自治体は自然エネルギーを推進する役割を担う

1 都市の自然エネルギー政策とは

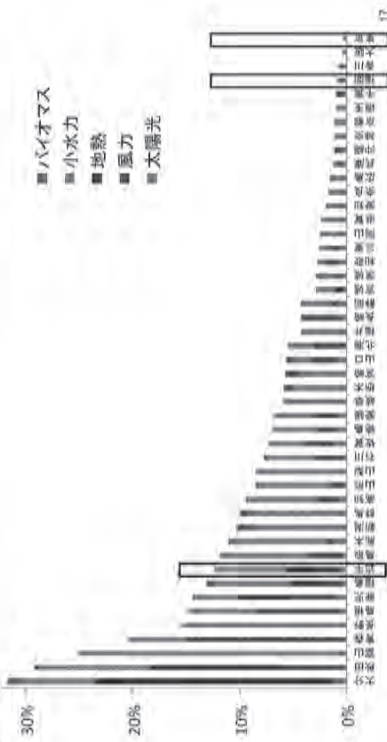
2 東京都の自然エネルギー政策

3 都市の力を活かす

自然エネルギー供給率(都道府県別:電力)

13県で自然エネルギーによって民生用電力需要の10%以上を供給

1. 大分県(地熱+水力)
2. 秋田県(地熱+水力)
3. 富山県(水力)
4. 岩手県(地熱+水力+風力)
5. 青森県(風力+水力)
6. 長野県(水力)
7. 福島県(水力+地熱)
8. 鹿児島県(水力+地熱+風力)
9. 鳥取(水力+風力)
10. 熊本(水力)
11. 新潟県(水力+バイオ)
12. 新潟県(小水力+バイオ)
13. 群馬(小水力)



東京都の取組み

世界的に見ても先進的な気候変動対策を進めており、太陽エネルギー利用拡大を牽引する「政策イノベーション」が期待される。

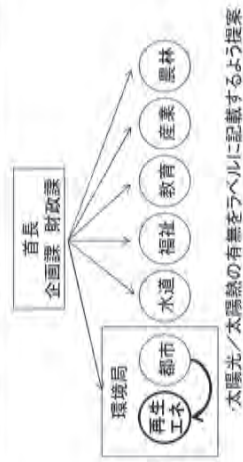
- ・ストッブ温暖化！東京作戦(2002～)
 - ・温暖化対策計画書制度、環境エネルギー計画書制度
 - ・省エネラベル
 - ・東京かざぐるま、水素バスなど
- ・東京都再生可能エネルギー戦略(2006)
 - ・2020年までに20%程度の自然エネルギー利用という高い目標値
 - ・需要プルというコンセプト



- ・東京都気候変動対策方針(2007)
 - ・独自の排出量取引制度
 - ・100万kW太陽エネルギー利用
 - ・エネルギーのグリーン購入全国ネットワーク
 - ・白熱球一掃作戦
 - ・省エネ促進税制
 - ・500億円基金



東京都マニシオン環境性能表示 100万kWの太陽エネルギー利用拡大



太陽光/太陽熱の有無をラベルに記載するよう提案



東京都による政策のパッケージ化 太陽熱普及

単なる普及啓発ではなく、経済的手法・情報的手法など様々な政策手法のパッケージ化により、太陽エネルギー利用拡大を目指す。

- 計画的手法 ... 都市計画への組み込み、ガイドライン
- 規制的手法 ... 自然エネルギー義務化・ソーラーオブリゲーションへ
- 経済的手法 ... 戸建て・集合住宅への導入補助、企業への減税など
- 自主的取組 ... 協定や環境金融プロジェクト
- 情報的手法 ... マニシオン性能ラベルなど
- その他 ... 従来普及啓発に偏りすぎたが、政策のアナウンスメント効果と合わせた効果的なキャンペーンとして使う

- 普及啓発
- 環境教育・学習
- 環境投資
- 科学技術の発展

地域間連携による地域のエネルギーとファイナンス

国内の地域エネルギー事業のこれまでの事例とは異なり、地域に便益がもたらされる統合事業化モデルを開発



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100%自然エネルギー自治体の成功要因

- 自治体の意思決定者と強く協働できること
- 自治体の構造に弱点があること
- その自治体に本気で取り組むパイオニアがいること
- 市民参加が進んでいること
- 自然エネルギーへの安定的・野心的な国の支援制度
- 既存のエネルギーの価格上昇

参考：ヘルリン自治体サマリー・ペアメンの調査より

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- 1 都市の自然エネルギー政策とは
- 2 東京都の自然エネルギー政策
- 3 都市の力を活かす

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人材とネットワークで進める

100%参加のパイオニア、50%の事業パートナー、10%のサポーター、1%のボランティアなど厚みのある広がりが必要



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なぜ東京都にはできるのか？

1. 明確な意志とリーダーシップ
 2. 「職員」の力と高いモラル
 3. 政策を中心とした「知とネットワーク」の蓄積
 4. 「情報」と経験と実情をふまえた戦略的な制度展開
1. 都市の「課題」を都市の「強み」に転換

都市部の自然エネルギー施策の可能性

1. 2030年、2050年までの中長期的なビジョンと目標値
2. 事業者と協力した都市型の自然エネルギー導入事例開発（集合住宅、屋根貸しモデル）
1. 地域間連携による自然エネルギーの恩恵が地域へ入る市民参加・地域参加の仕組み開発（地域出資、市民ファンドや地域エネルギー事務所など）
2. エネルギー事業者への情報開示要求の強化
3. 国への要望（固定価格買取制度・発送電分離・水利権調整など）

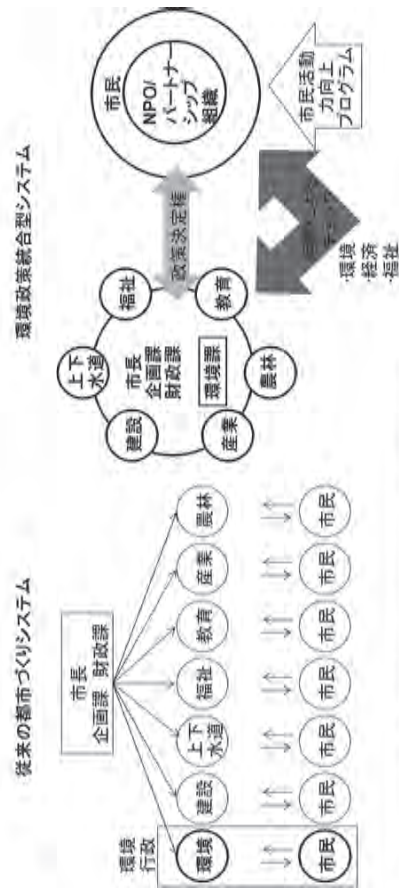
地域の中心として枠を超えて貢献する

域内の導入に囚われず、地域や国、アジアへの貢献を考える



環境政策統合の街づくりへ

環境を一部署の取り組みから全体統括へ位置づけ市民との協働へ



3.11後の自然エネルギーへのシフト

■都市の自然エネルギー政策とは

- 日本の政策枠組みの転換期
- 地域を活かす制度枠組みへ
- 都市の強力な政策

■東京都の自然エネルギー政策

- 需要ブルのコンセプト
- 域内での強力な政策パッケージ
- エネルギーの地域間連携

■都市の力を活かす

- 地域の弱みを活かす
- 大きな市場と購買力を活かす
- 環境政策統合へと向かう

■まとめ

福岡市における低炭素都市形成に向けて 報告書

2012 年 3 月

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