

The investment point on cooperative innovation in EVs for the spoke-smart cities : focused on Nordic countries and Korea

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Abstract

E-infrastructure economy for ICT Living-Labs is a need for economic and cultural changes in various types of cars in accordance with the supply of the electric car. Depending on the number of cases by analyzing the supply and demand of electric vehicles among Korea and Northern Europe countries, it was indirectly proved that it makes economic growth. The research design is analyzed with the data and how to respond quickly to focus on the possibility of potential changes to the infrastructure realization and commercialization of government enterprises or electric cars through the ICT Living-Labs in Nordic countries. The data indicates that the leading commercialization emphasize on the development of the electric economic convergence and scalability for electric vehicle. When it shows the time of the infrastructure as ICT Living-Labs being delayed, it lowered growth target results for the development of the electric car industry in the future. All this is from the reason of opening the E-convergence economy over time. It is required that Korea should prepare E-convergence economy. Public regional energy should be present through the consistent selection of development for energy linking E-economy and E-trans distribution. Korea needs to be many difficulties in building the E- infrastructure for ICT Living-Labs. Unlike the Northern Europe it is to prepare the active support of both government and business. The role of the government discovers that the power generation through the quick selection of the industry, as well as to connect with the growth of the smart cities with the EVs industry.

Keywords: Electric-Vehicles, Commercialization, E-Convergence, Smart-city, Spoke.

1. Introduction

This paper is just for how Korean firms should be presented the needs for future competition with the expansion research plan in the scientific and cultural edge for cooperative innovation in ICT Living-Labs Industry: focusing on the cooperation among Northeast Asia and Nordic Europe.

The economy of E-Infrastructure depends on the supply of electric vehicles(EV), according to Cultural and various types of economic changes on automobiles. Depending on various investment cases this has indirectly proved to make economic growth as analyzing the supply and demand of EV in Korea and Northern Europe. The research design is based on the assumption that the government and corporations how they must quickly respond to the construction and commercialization of electric vehicles' infrastructure, and the research are focusing that potential changes were analyzed for feasibility studies. A leading commercialization infrastructure mean that it is emphasized on development and expandability for Convergence Economy or electric vehicle. As the development of the investment infrastructure of EVs is delayed, the target growth rate of other sectors is also lowered. Unlike E-infrastructure in Northern Europe, Korea has many difficulties in establishing it, There is a need to consider the government's active support for this field and the direction of corporate investment. The role of the government is not only the innovation of the electric or hydrogen car industry, but also it's rapid selection of the industries that

connect them.

From ancient Roman times, the exchanges among European and Asian countries have pursued closely by economic, cultural things. At the new industry when it was found around the 19th century, the center of trade has moved to Europe through the exchange of the East. Before that of the driving force behind prosperity in Europe, Finland has took place mingle with the Vikings ethnic peoples and Asian exchanged. The Byzantine Empire and the Slavs can be seen as a clue to be formed of the Balkans with Bulgaria from Asian. Germanic-Slavic and Magyar converged with the sect of the Huns, became the Austro-Hungarian Empire. The current global economic situation is due to open mood the Eastern Europe, Balkans which is certain to benefit the other countries of CE Europe, with also close to trade off economic sanctions against Iran in the Middle East.

Therefore, the shifting of economic axis to be moving eastward is deemed to the most important role between Europe and Northeast Asia.

The study examines the characteristics of social science and technological play as a key role in converting the developments of the economic historical ideas, and proposes a new industrial policy and the characteristics and implementation strategy for the 21st century on going to convergence paradigm.

2. Comparison with Previous Studies

Tompson (2015) has argued at his book that the fall of car was shown that while Schwartz isn't antiautomobile, he does predict the further decline of the use of private cars, as the linked trends, in the United States and globally, toward walkable cities and shared transportation (trains, carpools, Uber, etc.) continue to increase. Schwartz weaves his experiences in a folksy, effective manner and is unapologetic about his Brooklyn bias. His major themes include "active transportation" (using muscle power), multimodal transportation solutions, accessibility, and the use of intelligent systems to plan traffic routes, while discussing transportation regulations such as the Model Municipal Traffic Ordinance of 1927 in an entertaining way. Historical sections highlight the heroes and villains of U.S. traffic planning as well as key roadways.

Finally In near future it means that the EV manufacturers will be rivaling the smart car with a smart city. The significance of green city design in reducing greenhouse gas emissions from vehicles. According to the paper, the global city is capable of using good design, infill development and infrastructure investments to transform existing medium-low density neighborhoods into walkable compact communities. This notes that dense neighborhoods are far more energy-efficient than even "green" sprawl, and innovation trends in green building seem to benefit compact development with EVs.

However, Stephan et al. (2008) have already pointed out that using the company that developed and produced the 'smart' city car. In the other hand, the ICT industry also needs to progress alongside various industry trends, particularly through finding ways around security and privacy, integration of new innovations such as machine learning for a self-healing intelligent transport system and the complete inclusion of various elements within a smart city system.

Hui Hu et al. (2016)'s study detects that Electronic vehicle identification (EVI) technology is often introduced to implement congestion-based toll. This paper presented an ex ante evaluation method for EVI adaptability and discussed the feasibility of this technology in congestion charge on the basis of assessment. this method can be used to evaluate different EVI application scenarios or other IoT technologies. They suggested that the adaptability of this technology application in urban traffic was the feasibility of this technology in congestion charge on it. System dynamics was introduced to qualitatively analyze the effect of EVI on urban traffic systems with feedback chains. An EVI adaptability evaluation model was then developed based on principal component analysis (PCA) and data envelopment analysis (DEA). Thus the adaptability trends of the two scenarios between 2003 and 2012 were analyzed and proved to be consistent with the practical situation. The findings had significant implications for policy makers who determined the priority domains of internet of things technology applications by assessing the adaptability of these technologies before deployment.

Electric Perspectives (2014) present an economical attractive city for the San Francisco Bay Area in which is the U.S., leader for electric vehicles, according to ChargePoint, the nation's largest network of electric vehicle charging stations, ChargePoint's list of "Top 10 Metropolitan Areas" for electric vehicles ranks cities based on the number of electric vehicles owned as well as the number of public charging stations available on the ChargePoint network.

The above studies were emphasized for the success of electric vehicles that depends mainly on the performance of the battery and the charging infrastructure. Alonso et al. (2014) studied that the large scale deployment of electric vehicles (EVs) has yet to be achieved. The smart coordination of EV demand addresses an improvement in the

flexibility of power systems and reduces the costs of power system investment. The uncertainty in EV drivers' behaviour is one of the main problems to solve to obtain an optimal integration of EVs into power systems. This methodology has been applied to an existing residential low-voltage system. The results indicate that a smart charging schedule for EVs leads to a flattening of the load profile, peak load shaving and the prevention of the aging of power system elements.

In a paper that analyzed the role model of KAIST University physics at Jung Haung(2004), we reconsidered the spoke economy and smart-cities by converging them together. This is a convergence article by S-curve which is a growth curve of technology introduced a case of Northern Europe by research analyzing the interaction of ICT policy by S-curve model. However, the research through compatibility cluster analysis of electric vehicles (Hui Hu et al, 2016) or others have been accumulated, and relative results related to the theoretical consideration of that model are representative. In addition, the smart cities of ICT Living-labs with the competitiveness of EVs are because the demand will increase explosively.

So Every entrepreneur or business professional will perceive the driving culture which will get inspired and find ways to reach customer loyalty. Sometimes they make another way to ensure business success greatly according to their strategy mapping capability. However this rapid innovation is possible to S-curve of EVs. Although products industry group begins to convergence, but the converging of products is not because all things are not intended to be commercialized soon innovations (Seo, 2015). Thus it is time to raise the competitiveness of the Korea.

3. The innovative edge through historical System

The first is the emergence of new trading paradigms. Until the end of the 20th century has been expansion of foreign interference in the developing world for innovation and economies of scale in leading enterprises. by looking of their relative values to the past, mutual different regions in the contemporary (Finland, Hungary, Bulgaria VS. Northeast Asia including South Korea). We share the scientific and technical areas and cities that have been developed in the industry. This is to create a new innovation in the same area that can be oriented to match the EU on the sphere of European Living Labs through mutual sharing.

The second is the economical exchanges to change the local industrialization. Most of the industrial activities of Humanities and Social Sciences is formed in conjunction with a variety of services, it has been developed in accordance with the externalization of the production function by multinational companies.

The third is the reconstruction of historical trade routes and restoration of research cooperation. If the trade area is formed by creating new and innovative path it can be extended to the law of increasing returns effects and radical innovation and distribution.

The fourth is the industrial innovation and consumption. Europe's manufacturing industry going towards the east of Europe is the European production base for manufacturing this initiative is continuing under the German and the United Kingdom. On the other hand, the convergence of ICT and production / research is accelerating. They have been converted into an office-type facility has a chimney in the industrial town, which is formed by convergence industrial complex office out of the existing industrial cluster. This is because the expanded innovation in terms of cost reduction through the physical bonding of the ICT and inclusion of industrial investment value creation and consumption has been established at the same time.

The EU has the living labs for innovation in Europe, so initiative Korea and the European cultural edge and orthodox meets, when the cross-regional sharing for new innovations has them, the S curve of technology growth will proceed consumption.

Through this research, Europe will be able to share directly to ICT science and cultural history, such as the Korean Wave from South Korea, with participation in the Basic Science and Technology (Hungary) from the European Future Living Labs Industrial Park (Finland) Ecological Life in engineering terms (Bulgaria) makes it create value in the future collaboration. Contemporary is able to free a global new normal era predicted, it will require restructuring and new economical active population since the post-industry, overcoming the situation of geographical distance problem, the situation which did not link as a matter of ideological era. So these meets can create a new sharing and space for collaboration between Northeast Asia and Europe and develop innovative ability to replace shorter PLC(growth cycle) and get the new products and services.

In the timing of introducing elements of the overall Humanities and Social Sciences industry, Korea and Europe have to be given personnel to cross it in South Korea as Europe Living Labs, forming a chapter of short-term exchanges and cooperation at a lower cost and will make the times to life. For example, consider participating,

considering converged with the Living Labs Europe as the past Korea villages(高麗村) or Sinrabang(新羅坊) means a scientific and cultural collaboration.

3.1. Korean Substance of the cooperative innovation in ICT Living-Labs

It has formed a scientific and cultural edge only in one place before, the R&D in convergence with ICT escaped from manufacturing- distribution, at the same time are able to share their outreach with expansion of culture and science through cross-training in different areas between Korea and Europe.

For example, In the past 1989 Samsung Electronics and 2006 Hyundai Kia Motors were not the level of cooperation which is established simply by plant, but specialized academic scholars and citizens and local governance that are reproduced by convergence. Goods being produced and distributed in the region will be consumed, and globalization should also be given the capabilities of the logistics system occurring at the same time. This is because the more active overseas direct purchase(ODP) through e-commerce is also being expanded the more scientific cultural edge with ICT converging. R&D center like Silicon Valley (area) is limited on a place, but the new living labs through trading off between Korea and Europe can be presented based on this fundamental ways when introduced to the industry a culture and social innovation as the elements in the overall Humanities and Social Sciences.

The industrial areas of the new normal era which is difficult to predict the future, need to making a continuous and systematic business plan. With the introduction of such eco-environment, culture, arts events as creating consumption of the region it is to be accessible to the international exchange.

Even if social consensus among the local people, between central and local governance, among countries are needed, and also the participation. This first should be coupled to the global cooperation and organic Structures of achieving national development, not the dimensions of businesses exchanges only within the local complex.

3.2. EU established the ongoing research in the E- field

The ICT convergence industry status makes market characterization. Each counties have their own way for Europe's position on E- development. In the Eastern Europe transition and other practical social science aspects of Western Europe's trade has been neglected in the region and merchandise trade. The existing ICT research and development is also because the trade is established in terms of national interests. To overcome them the new innovative convergence is created and to build a joint strategy for commercialization of this. A creation of science and technology, is because basic sciences is presented in the Humanities and Social aspects, it will be a new transition of Living Labs Europe pushing for this through Asian cultural research in Europe.

For example, South Korea is composed of earth industry type and percentage of residents with researchers they engaged in accordance with current law. In Europe, traditionally the village is a religious process (diocesan cathedral) from the hub to be promoted to a city regarded it as an important cooperative target. Jobs are created as the expansion of a cooperative convergence between urban industrialization, As a result, the population has been influx to solve this problem which was the limited space and research resources. As members of the cooperative movement to new areas such as Eastern Europe and has achieved rapid development. It began to require a new level model in the era of digital technology unlike the past.

Based on the facts that taken or given by Western influences on the East or Eastern influences on the West which it gave rise to innovation through the Northeast Asian exchanges, they are to establish the future collaborative development model.

3.2.1. The need for economic cooperation

After an integrated West and East Germany, Germany as the case that the capacity of the hub switch back to the East, the cooperation and exchanges is the concept to occur Smart Hub. The concept of this partnership model has once again undergone the lights. It will be presented by sustainable economic cooperation, digital research cooperation of areas where the competence of future research cooperation and exchange occurs. Just like South Korea's Songdo research and education park, the grounds presented by researchers of international cooperation and exchanges which it can not be the typical model of cooperation with Europe.

Europe and Northeast Asia should prepare the grounds to frequently cross traffic directly. They solve the problems arising from the humanities and social science aspects, thereto are required the response. Just because the energy, transportation, waste emissions, will be the humanities factor, rather than the grounds provided for research cooperation in water and sanitation facilities, such as the need to prepare in accord of the efficiencies on big data analysis. This can present a new cooperation model to calculate the result of a collaboration of the research and development among governments.

3.2.2. Potential for economic cooperation

It reviews as the Smart Hub at the Ronnie's thesis (2015), First, the automobile company Renault have a car-sharing actors in Latour progress in one of the French towns to explore its electric car market - looks through the lens of theory networks (Actor-Network theory).

The theory of Latour itself being revisited in several places with the development of the IOT but that rather reason on the basis interpret any technical development philosophy and theory is significant from the viewpoint of the above to be one of the important role of the humanities' scholars.

Second, it seemed that Ronnie has shown in his other 2015 papers, to recognize the numerous actions and work with us going unnoticed for survival of Smart City raises ethical questions also a task that requires a humanistic sensibility.

Third, the traditional cultural heritage in cities and towns in the Cape Verde pointed toward a Smart City (heritage) are further protected and how well humanists worried about what could be fused as part of the city, they will get out of lead. In addition to the beginning of listed things above, they are more ways and opportunities for the Humanities that will be enriching the discourse related to Smart City and citizens can be served as a co-creator of the city.

3.2.3. Economic Co-vision

Through an innovative case study occurred in the past Europe and Northeast Asia, the exchange may seek partnerships substantial economic and Convergence.

3.2.4. The detailed implementation challenges

For institutional, environmental and strategic challenges, Social Sciences and Humanities presented the three which can contribute to the cooperation exchange. This includes research to establish the model one another, as the differences between Europe and Asia. Northeast Asia and Europe want to create a more livable research cooperation which was constantly followed in the history of mutual efforts. In fact, there are any area cooperative 'convergence regions' as a policy act of the self-determined of naming separately.

Table 1: Electronic Vehicle Share (PEV Sales) in Norway

	2014	2015 Q1	Q2	Q3	Q4
Plug in hybrids	8%	11%	27%	22%	31%
Elective vehicles	92%	89%	73%	88%	69%
EV total	100%	100%	100%	100%	100%

Source: The Electronic Vehicle World Sales Database (EV volume.com), 2016

As shown in Table 1. the electric vehicle market in Norway grew around 71% in 2015 as compared to 2014. The deliveries of the year are totaling to 34,300 for the year as compared to 20,100 in 2014.

Representatives of Seoul Norway called for cooperation with Korea, which constructs hydrogen vehicles, as it reduces carbon dioxide emissions and switches to renewable energy sources to promote greening. In Norway, Korean and Norwegian enterprises contribute to green conversion to mutually complementary expertise in the energy, ocean, oil and gas industries, reduce consumption of fossil fuels, and make it to the sun, the wind and other energies. A major example of Norway and South Korea's energy cooperation appears to be Norway economic cooperation in the transport sector. Korean engine technology is combined with Norway's hydrogen production and infrastructure technology to make hydrogen-powered vehicles. South Korea aims to develop hydrogen fuel cell vehicles in order not to generate greenhouse gases that cause global warming. When converting the stored hydrogen to electricity, the fuel cell vehicle releases only water vapor and rotates the motor of the vehicle. Hyundai Motor Co.,

the nation's largest automobile manufacturer, became the world's first automobile manufacturer to mass produce hydrogen vehicles.

Hyundai Motor has sold 503 units of sitting scone fuel cell vehicles including 26 units in Norway. Norway plans to prohibit the sale of new diesel and gasoline vehicles since 2025 as part of a new, more environmentally and friendly economic approach. South Korea is Norway's second largest trading partner in Asia, also the largest international market for the Norwegian supplier industry.

3.3. Finland & Hungary's Role as Becoming a Global Innovator

The establishment of this study is limited to the area around the innovation that occurred in Europe and through the Northeast, This however target is Eastern Europe, at the same time to form a research consortium If it need a link between Western Europe. Finland has strengths in design and practical application, and in the case of Hungary, and theory of basic knowledge science have been developed. In Europe these two countries can jointly achieve the greatest outcome. For example, there was a case where Nokia operated R&D center in Hungary. However, the problem is collaboration for practical use and commercialization. Here I claim that by building the innovation city of commercialization like Korea's village within China in 9~10C, and furthermore the effect of its practical use can be maximized.

The current level is the form of Asian village that China sells at bargain prices with brand products of the world and medium and low price products produced in China, industrial factory zone in the former Soviet era in the past. However, innovation smart city that jointly develops product sales through this innovation through this city and directly supplies it into the living space, where various East Asian and Western world cultures and products are crossing each other, and with batteries, the fuel of the electric vehicle they will be opening the stage that will form a innovation smart village to be operated on roads.

It is to set not only the relative homogeneity among the Northeast Asia, and Finland, Hungary, Bulgaria in the past, which is a mix of Asian ethnic lines, it is still negligible, but also includes of Poland, Estonia, and accordingly to establish the relationship has had influence in Western Europe. Western Europe had popularized, merchandised somethings (commercialization: a matchlock gun, metal type, discovered the New World) from the past East, which is a good use of marketing and distribution. On the other hand, Asia had fields of strength elements that were created by a number of innovative new technologies and inventions (gunpowder, paper, compass, typography, silk).

In the similar case also created in Eastern Europe, In order to promote this economic cooperation policy, and Europe and has multiple roots in the past, it can also be analyzed to see what innovation policy is presented. For a variety of purposes, there has been such Silk Road, Amber Road, Paper Route (paper introduced the way), Sea route inward Europe as the interaction and distribution.

4. Technology Growth S-Curve and Regional Independence : Companies towards the E-economy

4.1. Energy Changes and Electronics Development learned from the System

The car industries still enable to act the existing situation further, in according to the decline of oil energy prices and the expansion of shale gas. It, however, is important to note that consumers' choice is starting to switch from ICE (Internal Combustion Engine) vehicle to EV (electric vehicle). At this point, it is just another alternative technology growth curve. For example, from household appliances (color TV, refrigerators, computers, etc.) to the mobile phone, the contacts have appeared that the demand is surging. There is a theory of the technology growth S-curve for demand to be established.

Kim et al. (2013) argued that in the view of technology growth vs. substitution curves, they are to provide a prediction on the coming generation's multi-media about smart situation. As their outcome, digital TV has been advanced onto the meeting its technology growth curve from an earlier version(2005) to smart digital TV (2013), which has already come to the market maturity stage. So, EVs battery energies are similar case like those of technology growth and substitution curves.

The substitution curve shows only the S-curve shape as the growth curve, the newly developed technology curve showing how we're going to deal with technology that currently dominate the market. It will figure out how to replace the S-curve shape that a new technology is initially failed at once, but it eventually encroaches on the

existing market for something new. Once consumers begin to recognize the superiority of the new technologies on the market because it replaced at a rapid rate.

In 2015, EV demands increased by about 60 percent all over the world. It is syndrome on the first stage. When compared the same growth rate of the Ford Model T in the 1910s, because it's also roughly the annual growth rate for sales through 2020, Tesla forecasts, in other cases, solar panels and LED light-bulb sales are following a similar curve.

The spread of electric vehicles can lead to a situation of global crude oil oversupply, even if this is expected to grow further in early 2023. The year of 2014 was exactly 10 years from the subsequent oil prices. Overall energy demand will be continued to increase, however, coming time is to appear that the demand on the technology growth S-curve grows rather rapidly in higher or lower point in the price of energy and development of renewable energy.

The reason is that low energy prices for electricity surge the demand of energy-related products, and the battery storage really can solve some of the issues faced by the growing demand.

Table 2: S-shaped curve of technology growth demand, to meet the energy source

Growing year - When demand spikes	Technology Growth S-Demand Curve	Demand surge/ incentive	Supply Firm/ Govt. (Top leader)	Gorvn's Infrastructure priorities- Cities
1922-1960	Refrigerator	1930~1965	GE- US	NewYork
1966-1988	Color TV	1964-1979	Sony- US	Los Angeles
1983-2005	Computer	1973-1994	IBM- US	San Francisco
1992-2015	Cellphone		Nokia- Finland	Helshinki
2020-2040	Electric Vehicles	2015-2045	Volkswagen-Tesla, Norway	-
2040~	Smart City with EVs	-	-	San Francisco/ Oslo

Source: Seo (2008, 2016)

Initial refrigerators and dishwashers in the past were also supposed to be symbolic of wealth for expensive prices, and there were no ordinary household necessities. However, in 1932, GE expanded to mass production markets, in addition to developing compact compressors, it increased rapidly. Refrigerators contribute to the growth of the city. The population of Florida was only 20% of the population of New York State in 1950. Such a thing, in 1980, it increased to 50% in New York State. As a result, in 2015, it finally went up to 3rd in the population, overtaking New York. From 1950 to 1980, this period around 30 years will be inferred as being recorded in history during the completion era of the "refrigerator revolution" without sound.

The important point of view, here is that what people adopt with the surrounding-spoke seems to be able to create S-growth curves. The competitiveness of the iPhone rapidly expanded the demand of neighboring countries as well as the main destination of the country which used the conventional mobile phone. It was a strategy to designate and release only the major countries from the early stage and expand it to the surrounding area. However, this considered as the concept of growth hub from the aspect of marketing. However, in the case of electric vehicles, the surrounding spoke is also a strategy that can be simultaneously released for higher price demand targets.

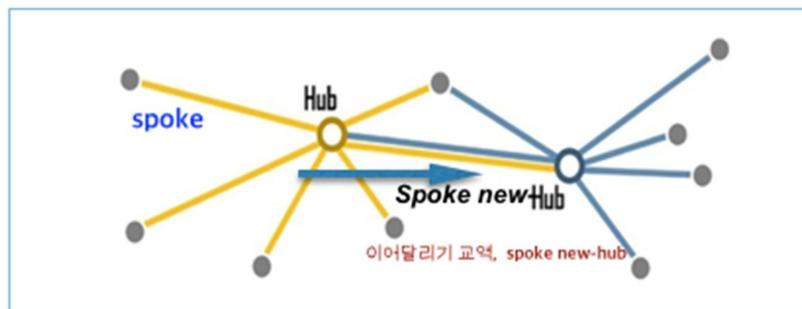


Figure 1: Spoke-new Hub capping of Electronic Vehicles

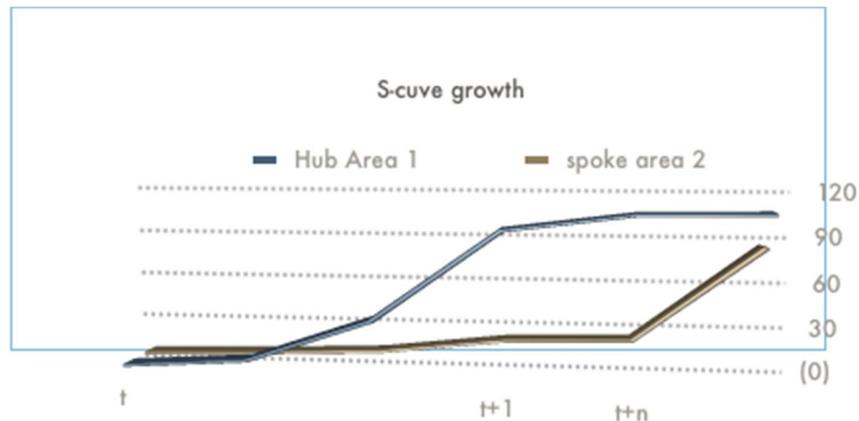


Figure 2: Regional S-curve growth of Electronic Vehicles

Experimental hypothesis: When dose the tipping point of an electric vehicle occur by region? In the past, the historical trade between East and West has grown due to intercontinental running trade.

Currently the batteries of EVs need to be recharged after they have been driven more than 215 miles (346 km). If the old battery fell sharply at charge rates 3 to 5 years, it must replace the new one. To replace the battery, which accounts for one-third, the cost of electric vehicles is difficult in reality, even though electricity is only one-third by the price of gasoline. Everything is possible for the person who replaced with a new car every 5-year cycle.

For example, as the trend to be replaced with a notebook or a tablet in conventional desktop computer, or it resolves this, and the shale gas can be a complementary material on the production of electricity, global industrial detonator in the growth of the electric car and E-economic convergence for it. Whenever each of the alternative energy comes up as the major energy sources, the electrical products seem to have the shape of the S-curve and their demand was soaring as shown in **Figure 2**.

4.2. The conception of Living labs Europe against Korea

For example, it is that European culture (innovation popularized) to open-develop a technology VS. East Asian culture is to protect-develop the technology (innovation, creativity). At modern times it may be cited as examples the entry of multinational companies in Korea.

As failure cases such as withdrawal or bankruptcy of a joint enterprise or business. First, LG-Philips in 2006, production plant failure (Czech Republic). Second, Daewoo Motors, in 2000 FSO plant failure (Poland), third, Hanwha failed noodle factory in 2004, and also withdrew the bank business in 2012, became KDB M&A (Hungary).

As success cases, entering in 1989 SEC (Hungary) expanded to four locations, and Korea Thai (Hungary), as fourth-invested enterprises (Slovakia) of the total national production to Kia Motors invested. Doosan Heavy Industries invested such as entering local plant "the Doosan IIMGB" (Romania). It has also emerged incentives partnership rather than rivalry. Investment incentives are transnational corporations (TNCs) have played an important role in the selection of a specific area. When similar local features between these competing countries were more obvious (Peter Kolesar, 2007). First, Hyundai-Kia Automotive - Slovakia (Zilina) is investment case. Second, the other is South Korea - Hungary (Dunaújváros).

So Slovakia expressed by the Tigers, Tarta Mountains of Hungary noted the growth in Leopard, including the board Modern-looking with Zilina investment practices of Kia Motors Slovakia in the last round of government in 2004 was a landslide victory against the Polish government. The reason is that, with 15% of the total investment, which allows the normal support EU legislation has added a number of special purpose incentives. Slovak government has promised to support the additional subsidy to both hospitals, houses, English education, highway construction, railway lines, airports for the children of their employees as an additional subsidy of investments. In addition, the government has decided not to raise the tax hikes, job security, employer contributions for social security, etc., Hungary does not need to be a minimum of investment and employment in itself, it was without reduction. The Korea tires similar case was due to investment incentives rather than regional benefits. By year Slovak government has reduced the investment incentives promised in 2005, South Korea dropped out of the tires of the Slovak

investment. In these circumstances Hungary hurriedly led by more than a desperate bid presented by the Czech Republic and Slovakia.

So this study for humanities and social sciences is the Living Labs Europe (Living Labs Europe) generating innovation in cooperation with the Science and Technology presented the case in Nordic Europe (smart cities) and Korea (EVs) occurs as a direct exchanges and conflicts, and to do this research and development post new normal era the presentation of want to go and build a new model.

4.3. Timing point of investment in EVs for spoke - smart cities

It is setting as a candidate area as the spoke-hub where the government is likely to invest in the future EVs facilities through building the spoke - smart cities and subsidies. First, spoke areas or cities (lagging) with a large gap between rich and poor, and regional distances can induce the chasm with technical acceptance on extensive EVs. Secondly, the investor's mindset is not a positive wave, because the negative side acts strongly.

Future innovation Once the infrastructure and autonomous service of electric vehicles are formed in the compact city, it will be created so that public bases and universities, enterprises, etc. they can study such as government policies that provide incentives for electricity supply. However, as the city grows, it must concentrate innovations by EVs in the city. For this reason, we have introduced past industrial clusters and overseas human resources. Innovative cities by EVs have to make an environment where these innovations make their living space better a commercial product and commercialize it even on a small scale.

The Nordic prerequisites must develop into mutual cities to be a continuous re-creation of EV collaboration products of public electricity and innovation. The young people of various external innovations around the world mean innovation also living in the city, and mutual trading of all products developed. The next innovation is a content platform for vehicles, the automotive content service platform changes past systems, new culture is formed in innovative cities, smart cities, but the fact is that electric cars will be played as an important role to make spoke-hubs.

As the results of in field research, the electricity production through further accelerate the E-convergence of every industry within emerging cities in Nordic Europe and South Korea, will expand the use of electric vehicles. By the public to participate actively in any development, it will fulfill the future demand in spoke-markets on EVs.

The direction of strategic investment in Scandinavia can be developed to hydrogen cars or electric cars according to the characteristics of fuel supply in the region. However, government investment in the Nordic countries maximizes profits and is not the time to lead the future automobile industry. Because the purpose is establishment of an innovative city, the problem is different. In the case of mobile phones, with the concept of touchpad or keyboard, customers brought victory to the iPhone Nokia came to collapse in the chasm with the technology and customers. However, as applying rapidly the telecommunications company they have grown more. the Nordic countries will focus on smart cities, not EVs development. Whether the Northern European smart urban form is decided on divided into hydrogen and electric cars, as in current gasoline and diesel car division, or integrated into one of the electric vehicles. This is the reason to analyze it in Korea perspective for developing future EVs.

However, it is argued that such a method has a complicated structure like a conventional internal combustion engine, and will go according to customers who want to add more convenient functions in the future, and emerging countries that will become new spokes hubs is whether to adopt this. This is because the energy source is the electric age. To that end, we suggested the use of hydrogen-powered vehicles only for vehicles with the necessary support system. In Norway, there is a dedicated road for hydrogen fuel cell vehicles only, it is an idea based on a case where demand for wealthy people rapidly increased for the purpose of saving time rather than money. Hyundai's idea is to be able to supply customers very quickly with only policy support without paying a lot of money if you are familiar with the customer and target groups. Hydrogen automobile effective yen requires more time, does not increase infrastructure investment and incentives.

Electric vehicles and hydrogen vehicles, will people succeed in investing? Which companies in the world automobile industry capture the initiative will be connected directly. This is a demand for technologies capable of early acquiring future automobile markets and continuing based on this.

Korea must continue to expand the demand layer more than the concept of the electric and hydrogen car, or the third car. Even though there are more advantages than hydrogen and electric cars, many advantages do not dominate the market. We will share a certain market share of environment-friendly cars, electric vehicles and hydrogen vehicles in the future. But the fuel cell included the 50 to 70g platinum for the reason why the price of hydrogen cars evolved in the future is difficult to lower. Platinum accounts for about 50% of the manufacturing cost of fuel cells.

In addition, first of all, electric cars are mainly used for second-class cars, mini-vehicles and compact cars, and the center of the internal combustion engine is exchanged for a short distance, and secondly, for long distances, the length of the hydrogen-powered internal combustion engine change distance traveling. Third, however, it will be regarded as unified as one requires considerable cost for diversification of charging stations and fuel cell systems in the automobile industry.

In 2030, the demand for cars in the future is a hydrogen car or an electric car? A smart city led by the government will depend on this. Chasm on the future car by a smart city has occurred. Currently, Hyundai-Kia Motors in Korea is trying to create demand with electric cars by commercializing hydrogen cars. They have to pay for the opportunity, and the sunk cost will follow them. Therefore, the concept of centralization must find out which automotive sector should focus its investment. Here is still a technical limitation of the electric car that the hydrogen car camp has emphasized, as Tesla has a new story. This is why Elon Musk's mention that EVs will exceed the maximum distance of 1000 km within one to two years is not just an exaggeration. Hyundai Kia Motors is relatively weaker than Tesla when it rapidly moves into a pure electric car-driven market. The greatest weakness of hydrogen production in Hydrogen car is the pitfalls because of the process of producing hydrogen, even in Nordic Europe and the United States, there is a very long period of time. The next step, the transient current point, is to set the maximum efficiency with hybrid technology as the investment option since cooperating with spoke-smart cities then.

5. Conclusion & Implication

This paper noticed that it is indispensable for Nordic and Korean companies to jointly implement E - ICT Living Labs from the viewpoint of marketing EVs. Its efforts will independently increase the ICT living labs as conception of the spoke regional economy to realize the E-economy. Because of such environmental technology development will develop into the focus of EVs in the smart cities or region. It is hard to generate organic cooperation with exploiting environment that has become a poor area like Arctic or deserted place. While emphasizing integrated technology strategies with smart cities, the most difficult aspect is the economic role of ICT living labs. The development of this EV is to build an ICT living labs in the spoke or smart city, so that it can be deployed in EVs, and the utilization rate of the autonomous car becomes possible it. Such attempts are limited to smart cities but only do not imply a reduction in EVs in big hub cities. Technological growth of EVs when diversifying the use of S-curves, low electric vehicles are required for low demand, is following expansion in large cities to enhance the competitiveness of the industry as a whole. But it seems that public enterprises like Northern Europe, unless they are opening a quick E-integration industry, will be mainly in collaboration with smart cities, so that they can actively participate in the private sector ever since it will not.

The global expansion of Northern European ICT living-labs will reform the market distribution channel of EVs for future vehicles. It is accelerating the change for built in IOT and the automobile market that includes expansion of electric vehicles, hybrid cars to the whole Europe. This is an indication that is not only a smart hub city but also spoke areas for the growth of technology S-curve demand. South Korea needs to develop any electric vehicle to prepare E - convergent cities. For this reason, commercialization and innovation of EVs with combining the ICT living-labs of economic zone by the public policy and the E-distribution channel will be expanded to the spoke economy like Northern Europe. The choice of EVs convergence must be consistent with the concepts of the current smart city.

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