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MICRO-STUDIES

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Governing Global Tech Firms; Is Taxation the Answer?

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Introduction

Global tech companies such as Google, Apple, Microsoft, Facebook and Amazon (plus their Chinese counterparts) have a quasi-monopolistic role in providing services that have become pivotal to our everyday lives. These global companies enjoy a global reach, and it is de-facto impossible to boycott them. The problem is twofold. First, big techs are avoiding taxes, which leads to many countries losing out and preventing them to reinvest in public infrastructures. Second, all states including the tax heaven states realized that big techs are swallowing whole sectors that have been paying taxes for decades and are suddenly gone. This dynamic is what finally triggered the recent serious debate over global tax regime.

Indeed, big tech is at the core of many ongoing societal debates concerning disinformation, social polarisation, or AI. These regulatory attempts were sparked by Edward Snowden's revelation about the surveillance operations of the NSA and other national intelligence agencies that relied on the cooperation with big tech. Snowden's revelations increased the public's awareness of big tech's capabilities that transform into tacit but significant political power. In the following debate, the question of privacy and mutual surveillance between allies concealed other considerable dynamics of this historical change. The transnationalization, digitization and privatization of security. Important social questions are: to whom are corporations and nation states responsible when national security agencies pursue global security agenda? This development is intensified since security agencies transfer power away from political institutions toward global corporations. Indeed, big tech can store and analyze big data, shape our daily habits, introduce technologies we depend on. Hence, they are in a unique position to develop future technologies shaping our lives regardless the national governments. Taxation is thus only one of many regulatory problems we are facing at the moment.

Analysis

Over the past years the question of taxation has emerged in the public debate. Because of their global value chains and customer base and the 'immaterial' character of their services, global big tech can avoid heavy taxation more easily. Taxes are not paid in the country in which the revenue is made but in tax havens around the world. Moreover, sectors that paid taxes on the national level are being dismantled by companies with global reach; the advertisement market funding independent media being the case in the point. The societies in which most consumers live lose out on a taxing a core pillar of today's economy. This development only increases inequality within and across nations regardless the growing economy. Ultimately, tax avoidance not only prevents states investing in their public infrastructure, but it also hampers development programs and contribute to global poverty.

In 2015 the OECD (together with G20) created the 'Inclusive Framework on Base Erosion and Profit Sharing'.^{1,2} This initiative is aimed at implementing measures to prevent global corporations from tax evasion. 139 states are part of this initiative among them many from the Global South. In addition, the finance minister of the US, Germany, Mexico, Indonesia and South Africa published an open letter in June 2020 calling for stronger taxation highlighting

the need for taxation in order to decrease inequality and foster strong global economies.³ This framework was formally supported by G20 in November 2020 and led to a consensus over 15% minimal tax at G7 meeting in the first half of 2021. The other interesting discussion was about proportional distribution of profit to states where the business has been operated that has not make it into final communiqué⁴ but was part of the discussion.⁵ Despite this surprisingly successful development at the international level, certain national governments still push for the national digital tax, which would have to be cancelled when the global consensus is reached, Czechia included.

While nurturing the debate over taxation of global corporations is the agenda of the OECD, it is the individual countries who implement (or aimed at implementing) individual tax regimes. Initiatives by single countries cannot solve the problem on a global scale but they can be harmonized with help of the OECD or put pressure on the OECD. An example for the latter is the French 'digital tax' introduced in late 2020.⁶ France demanded taxes from Amazon and Facebook against the very vocal US opposition. Other nations, most notably among them Germany, have not taxed big tech mostly out of harming their US business. However, the issue of a 'digital tax' is a pressing one and a consensus for making bigger efforts for taxing global big tech companies is emerging. The contrast between incompatible global and national efforts draws a fascinating new global political agenda. We have national governments fully aware of the need in global consensus because global corporations simply do not pay taxes where they do business. Moreover, and that is the game changer they are dismantling traditional sectors and therefore deflecting also traditional tax revenues elsewhere. Even tax heavens realized that they cannot profit out of this situation and will follow the suit.

Conclusion and Recommendation

The unique position of big tech and the distinct way in which they produce value poses challenges to national and international taxation regimes

However, global corporations do not oppose the idea of global tax because every business is interested in its own sustainable growth that depends on strategic planning on a predictable and stable economic and political environment. They are not interested in a world full of obstacles caused by national isolationist policies but in an integrated world, in which doing business is easier despite the possible burden of the taxation.

Introducing the policy of global taxation is imperative when it comes to hamper rising inequality but also allow for public funds to be used to combat contemporary challenges such as climate change. Big tech companies rely on infrastructures provided by the states (education, legal framework) and in order to safeguard this system balanced taxation is necessary, especially taxation in place where services are delivered.

States need to address this challenge in order to fulfil their role vis-à-vis its citizens. In this regard, one would ask to what extent this situation of an opened debate over global taxation will move the world towards further integration with focus on more just and

inclusive global governance in overall. Will states exercise its own power, or transfer it to some global center, for other questions related to the big tech, e.g. in the dilemma of global governance in security issues? Is the *"security from cyber space to outer space"* the next step as the G7 communiqué states? What is clear after this phenomenal success from recent weeks is the fact that the world slowly but firmly marches towards inclusive global order. The Czech republic would be well advised to support taxation initiatives by the OECD and the EU. It is not only in its own interest as small countries can be powerful in introducing and supporting such global policies but will never be powerful enough to enforce its own national policy without annoying more powerful countries or forcing corporations out of its national operations. It is also in its interest to make more stable, predictable and equal world where nobody is left behind.

¹ <https://www.oecd.org/tax/beps/about/>

² <https://blogs.lse.ac.uk/africaatlse/2014/03/07/tax-evasion-the-main-cause-of-global-poverty/>

³ <https://www.faz.net/aktuell/wirtschaft/mindeststeuer-ungerechtigkeiten-der-weltwirtschaft-eberwinden-17381915-p2.html>

⁴ <https://www.consilium.europa.eu/en/press/press-releases/2021/06/13/2021-g7-leaders-communique/>

⁵ https://www.irozhlas.cz/ekonomika/podcast-vinohradska-12-facebook-amazon-dane-matesova-wtb_2106110600_bar

⁶ <https://www.thelocal.fr/20210306/google-flags-higher-ad-rates-in-france-and-spain-after-digital-tax/>

II.

From the Ashes: Innovation and Evolution of the European Defense Industrial Base

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The European defense industrial base has largely stagnated. With the shift to Great Power Competition and increasing technological change, it must adapt to attract and scale non-traditional defense companies. However, the path to building a next gen defense industry in Europe will not come easily.

The United States and its European allies have traditionally enjoyed a capability gap over their adversaries since the end of the Cold War. During that period, the West's focus shifted to combating terrorism and capacity building in fragile states. As a result, the urgency to develop and field new systems to combat potential near-peer competitors has eroded. With the Soviet threat receding from institutional memory, Western allies continue to develop and acquire complex, bespoke multi-mission platforms that assume, in part, permissive operating domains. These assets include billion-dollar satellites, multi-billion-dollar aircraft carriers, and GPS-dependent ground and air assets. Underpinning the deployment of these technologies is the assumption of air and space dominance, which is changing due to the shift to Great Power Competition – between the West and Russia and China – and the increasing pace of technological change.

At the same time, these technological changes have been accelerated by the exponential growth in venture capital (VC) funding. VC funding involves VC firms made up of general partners and limited partners who search for and invest in high-potential startups. Over the last twenty years, VC funding levels have produced a good proxy for relative levels of innovation. At present, despite Europe's significantly larger population, it only has one third of the U.S.'s VC investment annually. This is increasingly true when we look at larger valuation startups called unicorns (startups valued at over \$1 billion). Of the 661 venture-backed startups who are now unicorns, only 78 are in Europe and only make up 8% of the total value of the 661 (valued at over \$2.5 trillion).¹

This has fundamentally changed the driver of research and development (R&D). In 1990, the U.S. Government and the private sector were broadly equally in terms of R&D spending.² Since then, they have rapidly diverged with the private sector now spending 4x what the government does.

To address this change, in the United States the government has begun courting startups and VC firms in order to expand the scope and improve the speed of funding for non-traditional businesses and startups in the defense sector. The strategy has been to provide initial grant funding and contract opportunities for startups, but also to match venture funding with additional, non-dilutive government funding. This has not been matched in Europe, where stagnant defense budgets and favoring of national champions have led to a relative dearth of innovation and a declining defense industrial base.

In many cases in the U.S., these startups and non-traditionals (companies outside of the defense industrial base) complement rather than replace large defense companies. Indeed, the big players have recognized the value of the different capabilities and skillsets these new entrants provide and have as a result nurtured a range of strategic partnerships with these companies, as well as directly investing in some of them via their own respective venture

capital arms. Comparatively, European defense companies have largely struggled or refused to work with these emerging startups.

In the U.S. from 2018 to 2020, the U.S. Air Force, and the emerging Space Force, have generated over \$710M and added 1,433 companies to the defense industrial base, across a range of emerging and disruptive technologies, including microelectronics, hypersonics, artificial intelligence, unmanned systems, and quantum. They've also nearly cut average contract award timelines in half, down from 150 days to only 76.

Further, leading DOD stakeholders intend to do so much more. The Air Force, via its AFWERX innovation hub, aims to help cultivate a handful of new defense unicorns – venture-backed startups with valuations above \$1 billion – in the next five years. To this end, they plan on deploying over \$600m to startups, as well as to small- and medium-sized businesses. The end result of all this ferment has been a marked improvement in the time it takes to field cutting edge solutions³

This success story has not been mirrored in Europe. Four key elements are holding back the European defense ecosystem.

- First, protectionism is still a problem in some countries. National governments retaining large stakes in European defense companies disincentivize potential European-wide efforts at developing new solutions. And where budget is available, it usually goes to bolstering these legacy defense companies rather than non-traditionals or potential defense startups.
- Second, where there are European-wide needs, Europe's legacy national champion defense companies tend to favor high-cost, multi-mission platforms. Developing these platforms, however, often leads to significant duplication of effort. A case in point: the Tempest Future Fighter Aircraft and the Future Combat Air System are two programs costing billions of euros each that are developing platforms with very similar capabilities.
- Third, venture capital in Europe, unlike in the United States, has not been incentivized to enter the defense sector. Contracts rarely flow to smaller companies directly, and instead are passed through to them as subcontractors on more niche and/or low-margin work, resulting in lower margins and decreasing potential attractiveness for investors. Additionally, there have been few attempts at the European or national level to provide rapid revenue opportunities or innovative, complementary levers such as governments matching private venture funding.
- Fourth, Europe's entrenched defense players continue to struggle to compete with technology companies and startups for best in class technical and non-technical employees, due to their heavy bureaucracy, comparatively low salaries, lack of innovation culture, and slow promotion timelines.

The truth is that, despite the progress outlined above, many of the same issues are still plaguing the U.S. defense sector. This should give hope to Europe: its situation is not far removed, and adopting U.S. best practices should yield similar benefits. EU defense entities and, most critically, national governments need to

provide much greater access to contracts to smaller entities and startups, even if it seems to come at the expense of so-called national champions. At the same time, entrepreneurs and non-traditional businesses must be found and incentivized to pursue the aforementioned contracts and grants. Europe has a robust and growing venture capital community that should be tapped. Similarly, university incubators and accelerators are key potential partners and sources of talent.

Europe has the population, defense spending, research, and talent capabilities to develop a flourishing defense innovation ecosystem in order to develop key new defense capabilities and secure itself. Driven by the external pressures of an aggressive Russia and unsettled alliances, it is increasingly important that Europe can develop and rapidly field new capabilities. However, if it does not rapidly create and deploy new mechanisms to engage with the startup and VC communities, it will continue to lag in key emerging and disruptive technology areas, making it vulnerable to the challenges in Great Power Competition both economic and security.

¹ Pitchbook 2021 Data. <https://pitchbook.com/>

² Congressional Research Service. "U.S. Research and Development Funding and Performance: Fact Sheet." January 2020.

³ Air Force Ventures 2020 Annual Report. Accessed at: <https://www.afwerx.af.mil/resources/AFVentures-2020-Annual-Report.pdf>

III.

Greening the European Industry in the post-COVID-19 World

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Introduction

By 2050, the European Green Deal includes a target to reduce transport-related greenhouse gas emissions by 90%.¹ However, several outstanding questions remain, towards the swift transition to Smart Grid (SG) technology across the European Union (EU). First and foremost, how SMART is the grid, and secondly, at what cost? SG technologies make it possible for Electric Vehicles (EVs) to proliferate without overloading the electric supply industry, and at the same time EVs are driving investment in SG technologies. Nevertheless, despite its environmental benefits, the number of EVs in use within the EU is still very limited.

In this case study, the authors will focus on technical measures to promote electro-mobility and SG technology. Based on an in-depth and comprehensive review of the relevant measures, the authors conclude that the most important policy instruments to promote EVs are tax and infrastructure developments in addition to financial incentives by government and stakeholders for purchasing and supporting R&D projects. These are condensed into concrete recommendations for policy changes mentioned below.

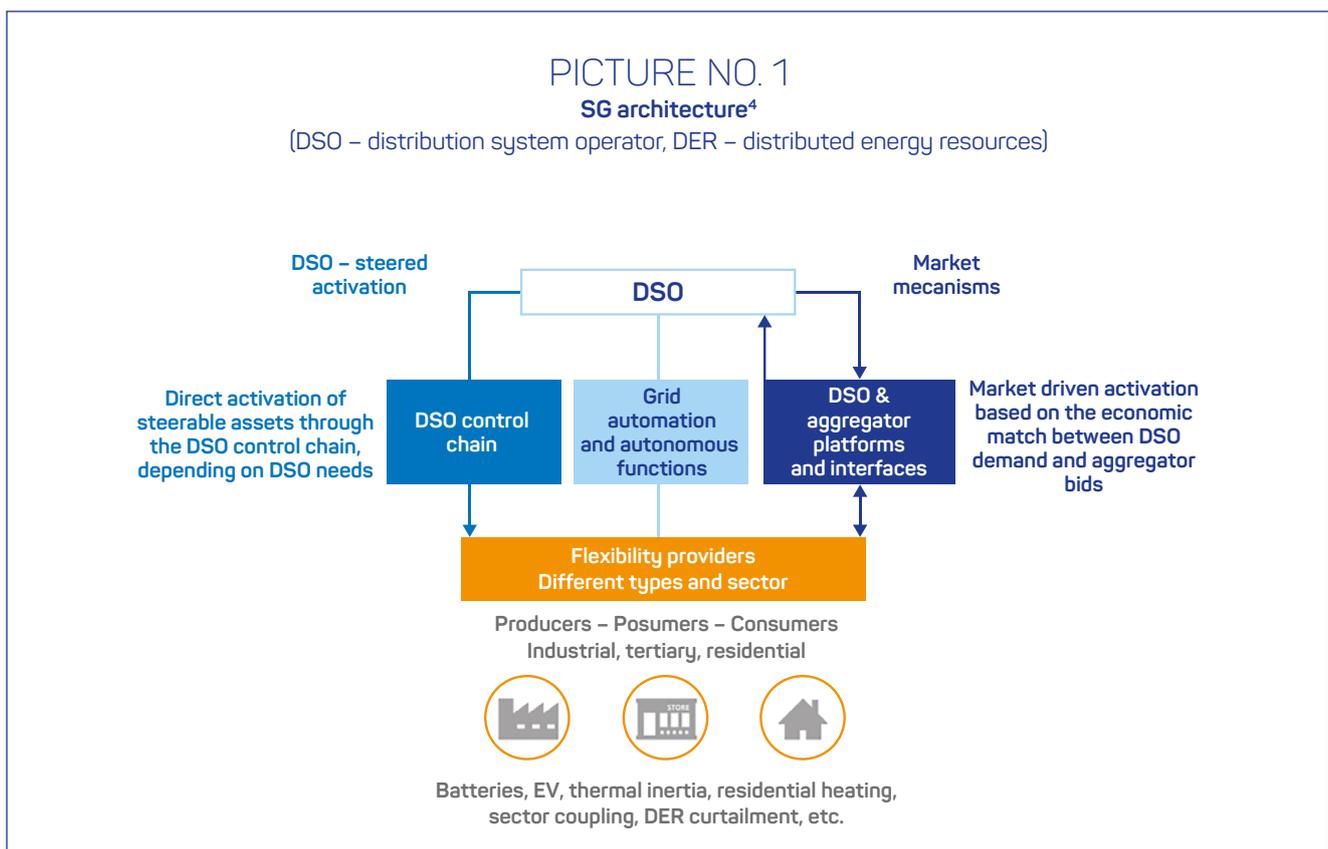
How SMART can the grid be: The Benefits

The concept of SG was built on an initial idea of advanced metering infrastructure (AMI). The aim was to increase the demand-side

of management efficiency and response; however, upscaling the initial concept and bringing in new standards and possible benefits resulted in the concept of SG². The main advances of SG compared to the existing grid is the two-way communication based on a digital platform with the possibility to use distributed generation of electricity and self-monitoring techniques³. Hence, the SG is a product of digitalization, platform-based software and machine learning, too – **PICTURE NO. 1** depicts the basic SG layout. How SMART – **specific, measurable, attainable, realistic and time-based** – is the ultimate goal of SG?

Specific set of requirements and tools is the basis for SG – smart watt routers for consumers (smart metering), battery energy storage systems at disposal in micro-grid areas, photovoltaic (PV) panels at home or at the office buildings, smart appliances (washing machines, dryers, etc.), or the EVs to provide vehicle-to-grid (V2G) electricity – a demonstrative list only. However, all these tools must be interconnected with an overarching management, control and protection system. Peak-load management is an important process, and the SG allows the **measurable**, flexible and distributed power grid to operate. Yet, it ought to be **attainable**, too, which opens another can of worms regarding the financial incentivization and public awareness raising, which may not be evenly distributed across the EU member states (MS).

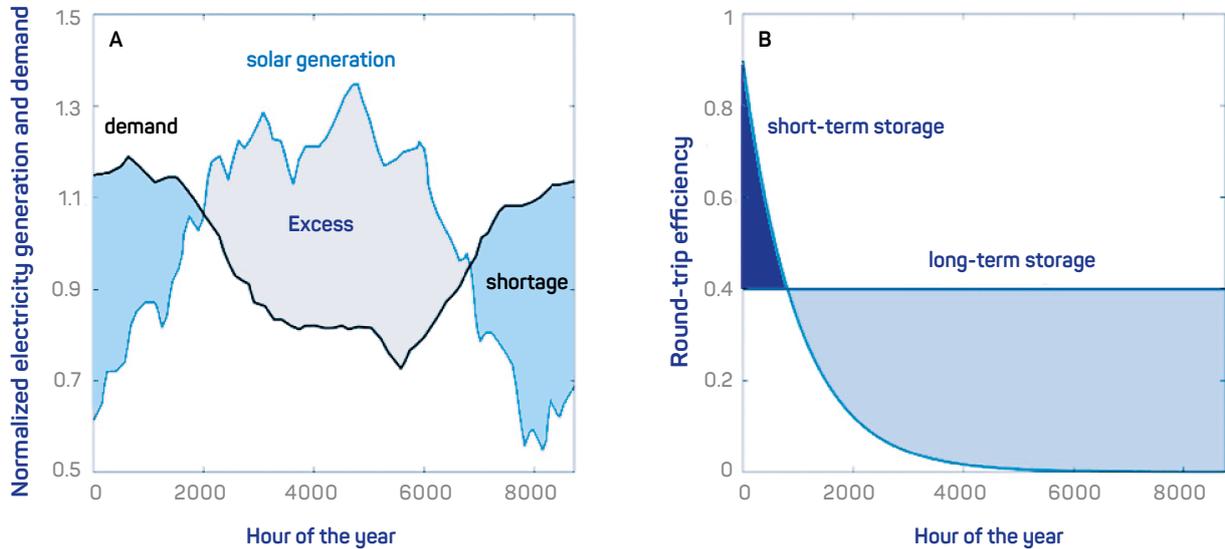
The SG itself is **realistic** and has been run in pilot projects all around the world⁵. The vast issue is the seasonal fluctuation in the power



PICTURE NO. 2

Energy capacity demand (left) and storage solutions (right)⁷

(PtH2 – power-to-hydrogen is the proposed solution for the long-term energy storage, batteries are used for the short-term storage)



grid, the storage capacity to cover the intermittency of renewable sources, as solar and wind energy is, and the grid integration on the European level, smoothing the peak-load electricity use in global. See picture no. 2 where the seasonal energy capacity for yearly fluctuation is highlighted. **Time-based** framework is not set for the SG deployment and its market penetration, however, given the EU Clean Energy for All Europeans package and Renewable energy directive, the respective directives had to be transposed, therefore favouring the SG deployment in the future⁶.

Cars and the city

Currently, the rising number of EVs, smart grid deployment and smart city strategy create an opportunity for bidirectional V2G deployment and peak-load shaving. As an example, Prague was chosen to illustrate the city environment.

In the Czech Republic, EVs had a share of 0.12% of the total passenger cars – if evenly distributed, it would represent only 1111

TABLE NO. 1
Prague traffic information^{8,9}

Prague	2020
Area (km ²)	496
Public charging stations*	153
Passenger cars	925 700
Paid parking spaces	147 500
Occupancy rate	70 %
Traffic volume – central cordon**	498 000
6AM – 6PM	74 %
6 – 7AM peak	6.7 %
4–5PM peak	6.9 %

*Of major companies

**Two-way 24h traffic

EVs in Prague¹⁰, which does not enable any major possibility to deploy the V2G bidirectional use. Optimistically, if there were 70% of them at disposal, on average, during the working day period, it would represent only 777 EVs with, for example, 60 kWh battery on average for V2G use in the peak-load hours or in the case of power outage. While the 2020 electricity consumption in Prague was 5,864 GWh with the Czech average share of 14.05% of renewables in electricity consumption and a share of 16.24% of renewables in total gross renewable energy consumption¹¹, the Czech Republic produced around 2,200 GWh from photovoltaic power plants¹². Although the infrastructure is improving and the EV market penetration rising, V2G deployment in Prague will prove extremely challenging on a substantive scale in the upcoming years. Furthermore, not all the EVs are equipped for bidirectional charging, and financial incentives and viable business model are missing for using the battery cycle life aside from charging the car itself¹³.

Barriers and Concerns

FINANCIAL BARRIERS

First and foremost, large upfront costs and lack of access to capital is seen as one of the greatest challenges to SG installation. While the initial investments into renewable energy technology is high, the Return on Investment (ROI) is undoubtedly seen in the long-term benefits. MS are required to ensure the implementation of smart metering under EU energy market legislation in the Third Energy Package. In cases where the cost-benefit analysis (CBA) is positive, there is a roll-out target of 80% market penetration for electricity by 2020 onwards. In the near future, we can expect to see that almost 72% of European consumers will have a smart meter for electricity while 40% will have one for gas¹⁴. There will, hence, be a need for improved billing processes, and the uncertainty of long-term benefits, and short-term costs in infrastructure and personnel training may create financial barriers to private sector investment in SG technologies.

REGULATION AND MARKET STRUCTURE ACROSS EU MS

Secondly, utility companies have a financial incentive to maximize the output of electricity across their wire-cables. Current utility business models are typically based upon a Rate of Return (ROR) whereas because their profits are linked with sales, are often reluctant to adopt technologies that improve the efficiency of power supply utilities. Moreover, many societal benefits associated with SG are not fully compensated by markets or regulators. For consumers, electricity rates generally reflect the average and not the marginal cost of electricity production. Therefore, there is a need for dynamic pricing that reflects the time-dependent cost of electricity generation, otherwise customers are less likely to be interested in SG technologies.

CYBERSECURITY

Thirdly, many technologies that enable the deployment of the SG, such as smart meters and sensors, can increase vulnerabilities such as the threat of cybersecurity attacks that can cause prolonged and widespread blackouts. This is costly, and threatens political stability in MS. High-level attacks on existing infrastructure can threaten stability of MS that are not as developed, leaving a security gap on communities less equipped with cyber resiliency tools. Therefore, developing complex-integrated systems also places demanding requirements on a wide range of technologies, especially advanced metering infrastructure (AMI) and energy storage systems¹⁵. The use of sensors and development of microgrids could reduce the grid's vulnerabilities.

THE CONSUMER & DATA PRIVACY

Lastly, many consumers still do not see the benefits of a SG, and hence, it is important to inform them about the social and

economic costs associated with today's outdated power grid system. Utilities and policy makers could play important roles in the process of defining and communicating the benefits of smart grid to customers. Not to mention, consumer protection rules are particularly important as they create a fair marketplace for both consumers and suppliers. However, the tension between the protection of consumer privacy and development of SG also imposes challenges on privacy protection rules. On the other hand, it is essential for both customers and SG service providers to have access to energy consumption data in order to optimize the use of SG technologies.

Policy incentivization – power your own city!

Utilities and policy makers play important roles in the process of defining and communicating the benefits of SG to customers. No matter how smart the grid is and no matter how technologically smart EVs are made, there is also a need for smart policies. The European Green Deal, alongside the Sustainable and Smart Mobility Strategy, need to focus on what steps are to be taken to modernize the power grid towards smart electric grids and how to connect the entire EU on this grid. Providing a transition guide and funding for each MS might provide greater incentive to switch to Smart Grids technology.

Under current policy schemes, smart grid technologies face several disadvantages. Firstly, to ensure system reliability, utilities and regulators often impose strict and discriminating rules on interconnection and DERs¹⁶. Secondly, a lack of consistency among policies at different levels of governments, together with outdated codes and standards, has also played a major role in preventing effective collaboration and integration across regions. There is a need for the EU to develop new codes and standards with the development of SG technologies, while at the same time creating universal standards that promote interoperability and compatibility of SG equipment.

Thirdly, a policy which sets up a mandatory requirement for developing energy storage systems in the grid by, for example, utilising energy storage projects funded under Horizon 2020 to create new market designs and business models in order to make these new services economically viable. Other policies include SG technology standards, customer privacy protection laws, rules governing the ownership of renewable energy credits, smart city policies, and approaches that are tailored to meet the needs of particular regions or market sectors.

Policies to promote smart grids include:

1. Net metering tariffs and time-of-use pricing
2. Interconnection and technology standards
3. Subsidies, targets and goals
4. Consumer privacy protection laws: It is essential for both customers and smart grid service providers to have access to energy consumption data in order to optimize the use of smart grid technologies while at the same time not exposing or exploiting the data.
5. Cybersecurity measures and protections: Virtual Private Network (VPN) for more secure communication and blockchain technology could help resolve security issues by providing a shared and encrypted ledger that is immutable to changes made by malicious nodes or attackers.
6. Rules governing the ownership of renewable energy credits

Concluding Remarks

The SG industry is facing tremendous opportunities and has become an inherent component of the emerging low-carbon economy. The costs required for the full deployment of SGs are

large, but the long-term ROI speaks for itself: Lower operating costs, reduced energy waste, more security, and a more integrated and flexible network are all within reach.

Offering MS' the possibility to use a wide range of policy instruments to promote electro mobility in the realm of the Green Deal is inherent. This includes tax and infrastructure measures in addition to financial incentives for purchasing and supporting R&D projects. SG is the way forward to not only powering our cities more efficiently, but also connecting our world and beyond to unprecedented levels of sustainable prosperity.

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