



User-Centred
Energy Systems

Fit to Serve?

The story about energy
service supporting business
models and systems

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Contents

Introduction	2
It is about services!	2
More than a product-plus	3
The business you're in: Product-oriented and service-oriented business models	4
The right capabilities	5
Shifting focus to the system	6
From the system in transition, to transition entrepreneurs	9
The savvy entrepreneurs doing institutional work	9
Transition capabilities	10
Towards a transition supporting system	11
Conclusions and recommendations.....	12
Policy instruments to support entrepreneurs become more service oriented	13
Policy instruments to support servicing entrepreneurs become more successful at serving the energy transition	15
Actions to support a paradigm shift among system stakeholders to support business models serving the transition.....	16

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Introduction

Thanks to the Paris agreements, Al Gore, Greta Thunberg, and the relentless flow of numbers and figures that provide proof of global warming, the sense of urgency to reduce energy consumption and stimulate the use of renewable energy has increased enormously over the past years. With all the attention the energy transition attracts nowadays, one could easily imagine that doing business in this market is an easy ticket to success. Sadly, this is not the case.

In reality, only a relatively small group of entrepreneurs is able to take advantage of this sense of urgency. Many different organisations, from municipalities, policy makers and politicians to trade associations and climate activists, agree that the rate of market uptake around the energy transition is too slow. Of course, there are many explanations for this. The complexity of climate change can hardly be underestimated, nor can the struggle to create solutions to solve the problem of market uptake. One thing is certain: entrepreneurs play a key role in the energy transition. After analysing dozens of business models, conducting at least as many interviews with energy entrepreneurs, reading up on relevant theories¹, and researching the characteristics of the markets in which they operate, as part of a project under the Technology Collaboration Programme 'User centered Energy Systems' by the International Energy Agency, we dare to conclude²:

The current energy transition market is too product-centered and needs to broaden its focus towards users, stakeholder values and human relations to increase or accelerate the uptake of energy solutions.

It is about services!

The conclusion above is built on the fact that successful companies have one key feature in common: they are in the business of offering services instead of products³. Actually, nowadays, in many sectors, increasingly we witness that value propositions are less often purely product oriented. Many propositions in many sectors are a combination of products and services or even a service-only proposition. The famous and often quoted successes like Spotify, Air B&B or Amazon are all services, enabled by smart and innovative products/technologies.

This is indeed no different for propositions in the energy sector. What might be considered as a pure product solution -like for example a heat pump-, very often is in fact an integrated

¹ This story is very much inspired by and builds on many strands of literature that focus on service design, entrepreneurship and transition (design) studies. See the bibliography for an overview.

² This work was part of a project under the Technology Collaboration Programme 'User centered Energy Systems' by the International Energy Agency

³ Janssen et al. (2018)



offer of a technology -heat pump- combined with services like installation and maintenance services, process apps, smart thermostats etc. This is already very common in the energy market. However, successful businesses in the energy sector stand out from the less successful ones in their ability to reap the benefits of a business model that fully supports the creation, offering and delivery of this combination of products and services⁴. They do so in a way that meets the exact needs of the customers, therefore extracting the maximum value from the service offering. In addition, many of these companies are run by an entrepreneur(ial team) that is skilled with the right capabilities to run a service-oriented business.

This is a lot less obvious and not as easy to do as it sounds. There are few successful examples in the energy sector. Many of the companies in the field of energy originate from technology backgrounds, and their businesses are built around the technologies that they want to exploit. In other words, they are very much designed to support a pure product-oriented value proposition even though their propositions actually consist of both products and services. Their business model is simply not designed to deliver this combination – it is not yet ‘fit-for-purpose’ – and this ‘unfit’ business model is one of the causes of poor market uptake of many of the innovative energy solutions available.

More than a product-plus

Let us explain this poor fit between the business model and what the sector needs by discussing the significant difference between products and services. Products can be touched, they have specifications, are produced and can be delivered to your doorstep. Customers use or consume their new products only after the transaction has taken place. A customer then owns their product and the provider is out of sight. Product-centered business models are therefore designed to maximise turnover – deliver as many products at doorsteps as possible – whilst minimising costs. Or in other words, success is linked to selling more of your product. An efficient value chain is in place to create and deliver the product, and the company relies on technological knowledge, technological innovation and an efficient production chain.

Services, on the other hand, cannot be touched and cannot be delivered to your doorstep. Also, the value of a service is only experienced during use. If a service is not used, the service simply does not exist. As a consequence, a service always requires some form of interaction between provider and user. The moment of transaction is often not the end, but the beginning of a long-term relationship between provider and user. A relationship in which the provider is needed by the customers in order for the service to be of value throughout the use phase. This relationship demands that the provider understands its users, their needs, their preferred way of using their service, their context. The provider needs to be able to ‘translate’ this knowledge into a suitable service proposition and accompanying business model, including the revenue structure and the right choice of partners, and often needs to do this iteratively since user needs change in the course of the use of the service. And in contrast to the product-oriented mode, success is linked to attracting more customers and retaining existing ones for as long as possible.

⁴ Mourik et al. (2021)



The business you're in: Product-oriented and service-oriented business models

The consequences of the difference between a product and a service-oriented business model are huge for the entrepreneur and how they organise their business. The tables and figures below provide a schematic overview of the difference between a product and a service-oriented business model⁵.

Product-oriented business model	Service-oriented business model
Viability of the BM rests on maximising output by selling as many units as possible, irrespective of performance post-sale, and minimising costs. Product push approach.	Viability of the BM rests on maximising profit through delivering value to users over the duration of contracts, which aligns incentives with policy goals and also with value to users.
Value proposition described in product specifications, outputs, in tangible terms – product quality. The offer is non-negotiable, value is diminishing as soon as the transaction took place.	Value proposition described in value for user and value during use. Based on delivering a product and a process at the same time. It is tailor made, customised, focused on usability, solving a problem or meeting a need. The value is less tangible, non-stockable, and stated in outcomes and experience.
Customer relationship is focused on transaction (purchasing). One-off, customers are hardly involved in the business model or value creation, and minimum customer contact is aimed for.	Transaction is the start of a long(er) relation with the end user, often the relationship exists prior to transaction, with the user co-creating the service.
Revenue model is based on value per unit	Revenue model is based on the duration of the use phase of the client, recurring payments.
Traditional value chain dictates the choice of partners, collaboration is mainly vertically in the value chain (supplier)	Customer value journey directs the choice of partners (strategic collaboration in the form of an ecosystem, suppliers are also co-creators of the proposition). Sometimes customers even become partners in the business model, codeveloping the value proposition, or becoming sale channels.
Customer segmentation is based on the product's specifications and functionalities (like m2)	Customer segmentation is based on needs and client specific details.
Activities are focused on short term, predictability, management, technological process efficiency and other aspects of the delivery or cost-structure. Service innovation follows product innovation.	Activities are focused on the long-term and include relationship building. The activities are produced in buyer-seller interaction and focus on improvement of delivery or cost-structure, for example through training or education of customers to maximise value, of seconders and intermediaries to increase value of delivery, and to renew internal competences, skills and culture to fulfil the services guaranteed. Product innovation often follows service innovation

⁵ We discuss these product supporting business models in more detail in earlier Annex related publications and on the fittoserve.eu website.



Resources are economic, labour related, commodities, and codified knowledge.	Resources consist of (tacit) knowledge, capabilities, people, enabling deep customer understanding.
The cost structure is based on the price of labour or natural resources and standardisation can further lower costs.	The cost structure is based on the price of knowledge, can be high labour intensive due to customisation.

The right capabilities

But, there is more to running a service-oriented business than just good business model design.

First of all, entrepreneurs can learn a lot from their customers. They need to delve deep into the lives and context of their customers and other stakeholders in order to really understand what they value and need. Their **sensing** capabilities are key in a successful service business. But sensing alone is not enough. It is just as important to translate the lessons and insights from research into new value, new service features. They need to learn to **conceptualise the gathered -qualitative and quantitative- user data into a proposition, a concept**. Third, in order to deliver value throughout the user journey, most providers seek collaboration with partners that are relevant in the use phase of the service. However, it is of utmost importance to offer a smooth and seamless user experience. Furthermore, the quality and characteristics of relationships shift from a product focus with a transactive relationship, to a focus on the use phase, with long-term service relationship. For example, the traditional relationship between contractors and installers changes when delivering an integrated service proposition. Instead of a client and provider relationship it becomes a cocreation collaboration. And consequently, it shifts the thinking away from finding the cheapest/fastest, to finding the best value (i.e. delivers high quality in an efficient way at a reasonable price.) so as to uphold the reputation of the service provider. Being able to **orchestrate** the different elements of the service and the accompanying partners well is invaluable.

And finally, entrepreneurs should be ready to **scale** their business. Not by focussing on efficiency and increasing output, but by providing new value throughout the customer's journey, by creating new partnerships, and by **stretching** this service-oriented focus throughout their business.

These five capabilities combined with the right business model are key to delivering the service in the right way, to be 'fit' to serve.



Shifting focus to the system

There is no easy, silver bullet type of intervention that turns every kind of entrepreneur into a capable business model developer for energy services in an instant. Of course, a product-oriented business model can be adjusted to be more service oriented, and the right skills can be trained. Without a doubt, the entrepreneur and their business will benefit from this. To a large extent, realising these changes are within the entrepreneur's own circle of influence.

At the same time, most entrepreneurs told us that they experience many difficulties and barriers in the system around them, making it challenging to run and scale their business. For this reason, we broadened the focus of our analysis to include the system in which these entrepreneurs operate, in an attempt to understand what is needed to remove barriers and stimulate the entrepreneurs running a service-oriented business in the energy sector.

This system these entrepreneurs operate in, the energy sector, is highly regulated. A wide range of system actors play an active role in regulating, stimulating, supporting, educating or subsidising the energy service market, using an even wider range of instruments. Legislators, politicians, policy makers, subsidy providers, competitors, grid operators, trainers and knowledge institutes all play a role. Despite these instruments however, entrepreneurs do still experience barriers and pitfalls. Interestingly enough the entrepreneurs we spoke with listed similar types of barriers and pitfalls to service-oriented business models that all can be seen as systemic barriers or failures: barriers that are the result of the current state of the system. A system that is transitioning towards a greener, more inclusive, sustainable energy sector. We categorised the listed barriers and failures into the following categories: complexity, uncertainty, technocracy, organised irresponsibility, and contestation.



COMPLEXITY

The entrepreneurs experience the energy system as a complex system-in-transition, where many subsystems are interlinked and interacting. The system behaves as one in hindering their business. It behaves as an unattainable, bureaucratic monster that cannot be influenced. For the entrepreneurs it is very difficult to reduce this mass into individual system actors with whom they can liaise and whom they can service and influence. In addition, they do not feel supported by the many regulations, supporting mechanism, instruments, subsidies, trainings, but often feel overwhelmed by the sheer complexity.



TECHNOCRACY

Entrepreneurs- especially those that aim to provide a service to the system, providing societal value, experience that the system very much interacts with them in a technocratic, product-oriented manner. This servitisation focus is not yet embraced in policy and instruments that aim to stimulate innovation. For example, most funding schemes, subsidies as well as other forms of support such as rules and legislation, certification, standardisation, are still developed to support the creation and



uptake of single products and technologies, individual components of services, for example PV, or heat pumps, but not the process of system integration needed when performing a deep retrofit. They do not sufficiently focus on the system integration that services often aim for, nor on the necessary processes of aligning system elements and accompanying values and interests to be able to compose single technologies as part of one service. The system is not sufficiently service supporting.



UNCERTAINTY

Many processes are currently designed as if a clear and upfront known outcome is within reach, with negative consequences when the pre-set goals are not met. This stems from a systemic practice amongst many system actors, (from authorities to corporations, to end-users and knowledge institutes) to take a project-based approach to problem solving. A project mentality is currently considered normal practice, with a no regret decision making process, SMART indicators, and no room for experimenting and learning.

There is some movement away from this project focus and attempts are being made at experimenting, piloting and learning about transformative innovations to provide, for example, new knowledge or to stimulate market uptake of energy services. However, even these are often still run as if they are projects, with key performance indicators and clear outputs, rather than as a search process. In addition, learning takes place best in a real-world, large scale use setting, but this is usually considered to be part of the commercialisation phase and thus the sole responsibility of the entrepreneurs. However, in light of the uncertain end game of the transition, this is too much of a risk for most entrepreneurs to take.

This issue of using project-based approaches to solve systemic problems is, to a large extent, the result of funding and subsidy schemes that do not appreciate that uncertainty is part and parcel of working in a transition. These schemes typically do not allow for the use of a process focussed approach that includes the appreciation of learning and failing to reduce this uncertainty. Failed experiments still generate useful results and are therefore valuable because they tell us what does not work which reduces the uncertainty around what the 'solution' looks like for all actors. However, the current system puts all the risk of this failure on the entrepreneurs while a process-based approach would share the risk among all actors.

Another example of the lack of appreciation of uncertainty as a 'normal' condition of the system can be witnessed in how monitoring and evaluation of progress towards a preferred energy system is performed. When monitoring and evaluation is carried out, it is rarely done in an integrated way by trying to understand the interlinkages and uncertainty present in the system. Instead, projects are evaluated in isolation against their original KPIs without considering the wider systemic conditions that led to the results in the first place. In addition, the learnings of these evaluations are rarely applied to new innovative iterations of the same experiment with the intention of achieve incremental improvements. Taking a programme or process focus to deal with the uncertainty inherent to transition processes is not yet normal in monitoring and evaluation practices.



ORGANISED IRRESPONSIBILITY

Due to the complexity, interrelatedness and uncertainty, and of course due to their specific position, it is hard for entrepreneurs to establish a consistent sense of urgency and coherence amongst system actors. The different actors that are active in the systems are all interlinked yet hardly ever orchestrate their actions on an overarching level. This is a process that is also called organised irresponsibility (Beck, 1992). For the entrepreneurs this results in a situation where they regularly experience inconsistent regulations or policies because national, regional and local policies conflict with each other due to lack of orchestration across levels, visions, narratives, policy goals and measures.

A second issue related to this lack of orchestration is that there is a lack of clear leadership in the governance of the energy transition. There is a lack of clear 'problem ownership' although there is a clear need for it, and many entrepreneurs for example crave for local and regional authorities to take up this role. This is a logical situation given that problems are usually multifaceted and cannot, by definition, be the problem of just one actor. The situation demands collaborative governance and collaborative action between multiple actors who negotiate their role and creates a difficulty for entrepreneurs, who often do not have the means to initiate such collaborative multistakeholder processes.



CONTESTATION

The energy transition is ripe with politics and contestation related to the lack of certainty as to the outcome of the transition and the impact this may have on the course of the change process. There are many different and conflicting perspectives on what counts as relevant knowledge, relevant expertise, or true facts, and concepts are framed differently depending on the actor doing the framing. A chief technology officer for example is likely to frame problems as technological, whereas a businessman might frame what he deals with as market failure, or as an issue of profit and loss. Even when actors seem to agree on an abstract level on the purpose of their actions, misunderstanding can take place in the process of interpreting and communicating these ideas (lost in translation), or tensions are created when choices must be made between conflicting goals (such as sustainability vs affordability).

In addition, the different system actors might transition at different speeds and this can create situations where conflicts arise between the old and the new paradigms. For example, institutions such as insurance providers, banks, and accountants often operate according to the old paradigm with respect to determining value creation and viability of a business model in economic terms. Because of that, innovative business models that create other types of value have a hard time finding capital or cannot easily be insured or accounted for. Instead of reflecting on this as a clash of paradigms inherent to a transitioning system, what often happens is that institutions and system actors frame the response they encounter as 'uncooperative' 'bureaucratic' or unwilling. An additional outcome of this contestation is that end-users feel this as a risk when they need to make choices concerning energy services, and only a few dare to choose the more innovative options. This skews services and business models towards safety instead of experimentation and transformative change.



From the system in transition, to transition entrepreneurs

The accumulation of the system pitfalls listed above causes inertia of the transition process, and great challenges to energy services-based business models, especially the more innovative and potentially transformative ones that aim to deliver services that could support the energy transition. Flexibility services for example, that allow people to generate value from using energy outside of peak times, or the use locally generated energy through peer-to-peer trading, or virtual power plants. Those entrepreneurs create their services in a time where there is still much uncertainty around the outcomes or the technologies to be used. Many of the business models supporting the delivery of these energy services are described as potentially radical, contributing to democratising the energy system, a new market or a new energy system. However, what we found in several of the cases we investigated, for example community virtual power plants in the Netherlands and Ireland, is that the business models supporting these very innovative services could only become financially viable when they were downgraded towards less radical versions, partnering with and complying with incumbent system players such as energy utilities, and becoming more business as usual with a twist, abandoning many of their transformative elements.

The savvy entrepreneurs doing institutional work

But we also witnessed a different kind of outcome for some of the potentially transformative business models and energy services! Despite many setbacks, several entrepreneurs were successful in breaking this pattern of reverting to business as usual, abandoning the potentially transformative elements. These entrepreneurs are, unlike their peers, capable of delivering business models and services that do contribute to the energy transition.

What characterises these entrepreneurs, or entrepreneurial teams (some of these are consortia or energy communities) is first of all that they have a business model that supports their ‘transition supporting’ energy service. These entrepreneurs go beyond creating a service supporting business model: they create a transition supporting business model to deliver a transformative innovation as a service.

Product-oriented business model	Service-oriented business model	Transition supporting business model
Viability of the BM rests on efficiency: maximising output, minimising costs. Product push.	Viability of the BM rests on maximising value for the end-user.	Viability of the BM rests on maximising value for the end-user and for other system actors, such as e.g. the grid operators, policymakers, society at large, the planet, future generations of end-users. Aligning user centeredness with system (societal/ or transition) centeredness.
Value proposition described in product specifications – product quality.	Value proposition described in value for user and value during use.	By definition, the value proposition is never fully fixed, but cocreated and iteratively adapted to the emerging needs of multiple elements of the transitioning system.



Customer relationship is focused on reaching transaction (purchasing).	Transaction is the start of a process of building long(er) relation with the end user to be able to continue conceptualising.	With so many 'customers', the relationship is nourished by being part of the collaborative solution searching process.
Revenue model is based on value per unit.	Revenue model is based on the duration of the use phase of the client.	The revenue model is based on value on a systemic level, also on the long term, but still with shorter term commercial viability.
Traditional value chain dictates the choice of partners (suppliers).	Customer value journey directs the choice of partners (strategic collaboration: suppliers and co-creators of proposition).	Solution needed on system level directs the choice of partners. The entrepreneur and sometimes the business model or service acts as intermediary, spanning across levels, sectors etc.
Customer segmentation is based on the product's specifications and functionalities (like m2).	Customer segmentation is based on needs and client specific details.	Segmentation follows the multiple value proposition.

A second characteristic of these entrepreneurs has to do with their interaction with the system. Many of them are very capable of turning systemic challenges into opportunities". They use the collectively experienced system failure as the *raison d'être* and legitimation for their business model. Some of these entrepreneurs even go a step further, by changing elements of the system in favour of both their business model and the transition, performing institutional work. They actively work towards changing the system, not just working within the system. They develop their service and business model with the explicit aim to contribute to changing policy, regulations, or answering questions, contributing to discourses that need to be concluded for step to be taken at the institutional level and are successful at doing so!

Transition capabilities

These savvy entrepreneurs, so capable at innovating around system challenges and or transition characteristics or sometimes even so capable at being part of changing the system, demonstrate a very distinct set of additional capabilities next to the servitisation ones listed earlier which help them to deal with the system pitfalls that other entrepreneurs experience as insurmountable. They create workarounds when opinions, instruments, laws or policy hinder the rollout of their proposition.

They are very capable at **sourcing: tapping into multiple resources** to be able to work around the complexity issue. They reduce the complexity by sourcing intellectual, authoritative and economic resources to collaboratively working towards the creation of value for the multiple actors with whom they are establishing long term strategic relationships.

A second strong transition capability this group demonstrates is **discoursing: the ability to create a new story**. These entrepreneurs create storylines that give shape to social and natural realities and also determine how these issues should be perceived and addressed. They are able to unravel 'The System' into individual elements and actors with whom they establish a long-term relationship. They appreciate that collective expectations and visions can function as a powerful institutional force, influencing the development and diffusion of



innovation and are therefore a powerful element of agency for institutional entrepreneurs. They make sure each of these individual expectations, perspectives and needs are addressed without losing sight of their higher transition goals. They deal with the felt uncertainty by anticipating, negotiating, and tailoring their value proposition to the values of other parties. They co-create, with these various actors, a new story. In so doing they adopt a process instead of a project focus, allowing for learning which feeds into conceptualising flexible, iterative outcomes, changing the service and the story being developed based on what is learnt collaboratively.

The last transition capability that can be witnessed is **networking: positioning as part of the solution**. These entrepreneurs use their informal, organisational and or institutional position to network in such a manner to build deep relations and create value for every relevant stakeholder. These entrepreneurs with their business models and services, through their networking and positioning, take on the leadership role that is so badly needed when orchestrating multistakeholder collaboration, often performing intermediary roles as part of their business model and value proposition. They are capable of acknowledging the diversity and contestation of knowledge in the energy field and take it as the starting point for conceptualising propositions that mediate across, or span across multiple interests.

Towards a transition supporting system

If we want to accelerate the energy transition and overcome the inertia, we need to establish a service focus, well designed service business models and thus many more entrepreneurs and initiatives to be successful at contributing to the transition. One way of approaching this is of course to increase the number of savvy entrepreneurs, those servicing the system and those that have transition capabilities to deal with the characteristics of the system in transition.

Training and developing capabilities and adjusting business models towards more service and transition orientation will certainly help. But, apart from the fact that the transition capabilities are only transferrable to others to a certain extent, even the most savvy entrepreneurs still have to operate in a system that falls short in supporting them, let alone their -less savvy- colleagues and competitors. Developers of energy services should be able to operate in a system that supports them and their transformative or transition-supporting service much more effectively. This system, consisting of actors like policy makers, regulators, researchers, financing institutions, influencers, competitors, end users, play an important, sometimes even decisive role in both the creation and uptake of energy service business models. This system is, at this very moment, not 'fit to serve' its energy service providers.

The question is, how could or should the system be adjusted to become less product focused and more service supporting. Interestingly enough, the required changes and key elements of a (transformative) service supporting system show a striking similarity with what we have found to be key to a service and transition supporting business model level and revolve around becoming more user-centered.



Product-oriented - linear system	Transition/Service-supporting system
Efficiency: maximising output, minimising costs, economic value focus	Maximising multiple value for all actors and the system as a whole as well
Relation: one-off support for individual actors,	Relation: creating long-term relationships between key actors in the system, facilitating multi-stakeholder collaborative processes
Focus on increasing transactions, project focused	Focus on the whole journey, including the use phase, process focused, focus on learning to iteratively conceptualise
Instruments (policy, law, rules) focused on linear, single solutions to single problems.	Instruments (policy, law, rules) appreciating complex interlinkage of system elements, and need for multi-level solutions, creating multiple value
Stakeholder engagement based on tasks and roles.	Stakeholder engagement based on inclusion of multiple values and needs. Focus on quality of process and relations.

Conclusions and recommendations

As we started this story, we dare to conclude:

The current energy transition market is too product-centered and needs to broaden its focus towards users, stakeholder values and human relations to increase or accelerate the uptake of energy solutions.

The work in this Annex provides much insight in the type of business models and capabilities needed to serve both end-users and the energy transition. And we can conclude that, without tackling the barriers to energy service markets taking hold, successful companies may continue to sell energy products (as opposed to energy services), thereby hampering the acceleration of the energy transition. This implies the need for framework conditions and support for companies to base their business models around service provision.

Our research highlights that we need a system that is fit to serve these services, its business models as well as its developers, and thereby is fit to serve the energy transition.

Many system actors have a role to play to become fit to serve. From authorities to institutions and end-users. Given the scope of the User Centered Energy Systems Technology Collaboration Programme, the funding body for this work, we focus our recommendations on what public authorities and policy makers can take as first steps to create a more service fit energy market for innovations.

We provide three sets of recommendations focused on:

1. Policy instruments that can be deployed to support entrepreneurs to become more fit to serve instead of product pushers.
2. Policy instruments that can be deployed to support entrepreneurs that are already really good at servicing to become also able to serve the energy transition.
3. Actions to support a paradigm shift among system stakeholders such as policymakers, authorities, institutions etc. aimed at better supporting servicing business models in order to accelerate the energy transition.

Policy instruments to support entrepreneurs become more service oriented

Below we list the type of activities that can be deployed to support entrepreneurs to become more service oriented. The activities are categorised into the traditional policy support instruments available to authorities: information supply and awareness raising, subsidies and fiscal instruments, capacity building, business support, infrastructure and law and regulation.

Supporting Policy instruments	Target group: Product supporting business model
Information supply and awareness raising	<p>Awareness raising on the value of a service approach, a user centered approach e.g. through a self-assessment tool</p> <p>Provide inspiring examples of entrepreneurs that made the shift from pushing harder to more service oriented</p>
Subsidies and fiscal instruments	na
Capacity building	<p>Develop and provide training in servicing skills: sensing; conceptualising, orchestrating and scaling / stretching, with a strong focus on:</p> <ul style="list-style-type: none"> • qualitative user research skills and how to build warm relations with clients throughout the customer life cycle. • sensemaking (analysing and interpreting data collected through sensing) and (co)creation of service concepts. • building new collaborations with new types of partners. • developing the back-office needed for providing a smooth service and customer experience. • developing a service supporting business model instead of a product supporting one. <p>Impact of training capacity increases when it's combined with coaching on the job, where new skills can be put in practice.</p>



<p>Business support</p>	<p>Public authorities can and should take a more active role in innovation and the process of servitisation. For example</p> <ul style="list-style-type: none"> • as launching customers for innovative (institutional entrepreneurship) energy service models, aimed at creating trust, direction and qualifying the market. • As an initiator of cross boundary collaboration, changing the traditional value chain collaboration. • In creating multi-disciplinary collaboration platforms and networks, focused on linking businesses with consumer organisations, governmental agencies, NGOs and with other businesses. These can be used to help the smaller businesses find suitable partners to create bundled services which then naturally are able to more easily provide multiple (also non-energy) value.
<p>Infrastructure</p>	<p>Provide access to market data that opens up customer relations and quantitative and qualitative data on customers that can help businesses identify valuable customer segments.</p> <p>Become launching customers for service-based approaches</p>
<p>Laws and regulation</p>	<p>Create trust among product pushing entrepreneurs in the value given by the market to service approaches by endorsing a type of service (brand independent), certification.</p> <p>Allow energy prices to reflect in real time the cost of energy supply, thereby encouraging the development of flexibility services.</p> <p>Concretely, government / regulators can encourage the move towards service provision by</p> <ul style="list-style-type: none"> • linking public subsidy to performance over time (P4P) • by forcing network operators to consider demand side resources equally with supply side resources • by changing the way in which they are remunerated. E.g., regulating utilities to use metered savings in Energy Efficiency Obligations and to contract with third party aggregators. Metered savings, in which rewards (subsidies) are provided ex post, once the impact on energy consumption is measured, encourage after-care, operational support, quality installation etc., and not just installation (with a deemed saving associated with it). In other words, government / regulators can impose the ESCo servicing model through the programme rules associated with subsidy programmes / utility obligations.



Policy instruments to support servicing entrepreneurs become more successful at serving the energy transition

As discussed previously, there is a large group of entrepreneurs in the energy market that has made the shift from a product push to a servicing approach and that aims to be frontrunners in the energy transition market. However, a large part of this serving the system group is still struggling to deal with the characteristics of a system in transition, i.e. complexity, uncertainty, organised irresponsibility, technocracy and contestation. And this group has underdeveloped transition skills necessary to deal with these transition characteristics.

Supporting Policy instruments	Target group: Service supporting business models
Information supply and awareness raising	<p>Public authorities can raise the awareness of the benefits and value of a service focus by:</p> <ul style="list-style-type: none"> • Providing inspiring examples of entrepreneur that were successful at serving the energy transition. • Providing best practice examples of successful multiple value business models to other system stakeholders. • Collecting lessons learnt about difficulties in contributing to the energy transition among this group. • Building and share a reference toolkit with best practice examples of transition business models, skills, experiences. • Provide system stakeholder maps.
Subsidies and fiscal instruments	<p>Provide subsidies and other fiscal instruments to support repeating and scaling successful, well designed servicing business models, subsidise process costs instead of only products.</p> <p>Redesign subsidy schemes:</p> <ul style="list-style-type: none"> • to allow for failing on the condition that what has been learned is monitored and evaluated and shared with relevant stakeholder to build on these lessons learnt. • To allow for an open end (outcome focussed) approach, on the condition that what has been learned is monitored and evaluated and shared with relevant stakeholder to build on these lessons learnt.



Capacity building	<p>Develop and provide training</p> <ul style="list-style-type: none"> • on sourcing complexity, how to unravel a strongly embedded and interrelated system into individual parts that can be negotiated with. • Training on discoursing: the art of storytelling and creating multiple value for multiple stakeholders on multiple levels. • Training on networking: develop cocreation training, develop process approach templates and accompanying training, demonstrate what it takes to build long-term multistakeholder collaborative relationships. <p>Train and coach entrepreneurs to explore and create the influence they can exert on the system.</p>
Business support	<p>Support them to become ambassadors and coaches for the product push typologies to foster training and learning between peers.</p> <p>Facilitate cross boundary collaboration, with distributed capabilities in the network.</p> <p>Support similar type entrepreneurs by analysing the systemic impacts of embedding their type of service, identifying the heterogeneous mash of actors and factors the service will impact and be impacted by. This is too a comprehensive task to be performed by individual entrepreneurs.</p>
Infrastructure	na
Laws and regulation	Develop public procurement procedures that allow for outcome focused approaches.

Actions to support a paradigm shift among system stakeholders to support business models serving the transition

In this final section we reflect on recommendations to create or improve framework conditions that support servicing business models to better deal with the five transition characteristics mentioned earlier. These transition characteristics, i.e. complexity, uncertainty, lack of governance, open ends and conflicting perspectives are the reality of the transition we all operate in at the moment, the current framework in a way.

The recommendations we are listing below run the risk of being difficult to disagree with, but also to not be concrete enough to grasp and start putting into practice easily by policy. However, we need to appreciate that the transition characteristics are part and parcel of a system and interrelated. When designing a more service supporting context for service focused business models, they need to be addressed in their totality. In addition, what the best way to support business to better serve the energy transition cannot be known completely, in fact, it should be the result of learning by doing, not by defining upfront.



If we appreciate this context, we repeat the conclusion that a systemic shift is needed in the way many system stakeholders think and work. This applies to policy makers, public authorities such as national and regional governments, agencies, institutions and market players. This shift is a collaborative search process, a learning journey, one where the focus should be on the quality of the process of collaboration, not solely on its outcome. This implies that the product-oriented focus in developing policy and instruments needs to be replaced by a service oriented (i.e., human centered) focus, embracing the creation of long-term relationships between key actors in the system, appreciating

The transition is better served when complexity is embraced instead of controlled. Policy makers can drive this approach by facilitating multi-stakeholder collaboration.

The energy transition is very complex. We use this word complex on purpose. It is not difficult, but complex. Despite numerous attempts, scientists as well as other system actors conclude that this complexity cannot be controlled. A first logical and very much embedded reaction of different stakeholders is to tame the problem. They attempt to turn it into a complicated (instead of complex) matter, enclose it, reducing it within boundaries that can be influenced. The issue then is reduced to something manageable with SMART outcomes that can be measured. However, these complex problems cannot be tamed. They certainly cannot be solved. At most, they can be worked with and - around.

An alternative servitisation approach is to organise the process needed to reach for the best outcomes. This implies creating collaboration across boundaries and silos as a means to explore the issue in its complexity like connections between (sub) systems, root causes and its effects, designing and testing possible solutions and iteratively monitoring what solutions do in different elements of the system. Trust in the increased quality of outcomes is designed collaboratively. This should not be and cannot be a task for an individual entrepreneur. In fact, all system actors should play an active role in these types of collaboration.

Create communities of practices and learning and allocate time to explore, understand, create and reflect. Establish long-term relationships built on trust between the heterogeneous group of actors that want to and need to be part of the solution, (even if they do not know yet what that solution is), and trust that all parties are working towards a mutual goal. Facilitate continuous dialogue to collaboratively identify the needs of all relevant actors and negotiate value.

The transition is better served when uncertainty is embraced instead of controlled. Policy makers can drive this approach by facilitating a culture of experimentation and learning.

Many processes aiming to accelerate the transition are currently designed and managed as if a clear and upfront known outcome is within reach. This is a logical and much practiced approach to face the inherent uncertainty. Usually this is done by creating a clear problem diagnosis, a clear path to solutions, pre-set goals, measurable milestones and deliverables



and a true or false outcome. Often there is thread of negative consequences when these pre-set goals are not met. This approach stems from a project mentality, which is a 'normal' practice, with a no regret decision making process, including SMART indicators.

However, the energy transition is a process, characterised by dynamic, uncertain technological and societal outcomes. A situation where the whole of the problem, let alone the solution, cannot be known, and where decisions are by necessity based on 50% of the knowledge. A far more realistic approach would be of dynamic programming. This approach implies working propositionally: a continuous iterative development of possible solutions, testing them, redesigning or rejecting them and continuing with a long-term perspective in mind. Rigorously rejecting the mentality of being able to know what THE problem is, defining short term approaches and tackling them one dimensionally and through technologies mainly. Continuously asking what problem needs to be solved, for whom, with what outcome is key and appreciating solutions can be processes next to products. Learning by doing and doing while learning.

Policy makers can drive this through the creation of incentives and places for focused experiments that are designed following a process approach, with uncertain outcomes, and reflexive learning, and with clear structures for sharing these learnings with further initiatives. The regulatory sandpits (UK, Ireland) and experimental rooms (Netherlands) are promising first steps towards such a learning approach. A second clear path for policy makers is the development and adoption of new impact metrics and evaluation indicators that allow for unknown outcomes, and that socialise that the costs and risks of learning and not having them borne mainly by entrepreneurs and their clients. Metered metrics as the basis for compensation could be one way of approaching this. A final path for policy makers is to redesign subsidy schemes to support not only products and or technologies, but also the processes needed to reach solutions.

The transition is better served when the 'lost in translation' and conflicting actions many stakeholders feel are aligned to support services. Policy makers can drive this by taking a first step towards collaboratively creating a new discourse and set of mutually reinforcing supporting activities.

In this energy transition, a large and very diverse group of actors plays a role. And each of them uses their own instruments and speak their own language. Obviously, most actors aren't even aware of their own paradigms, let alone the perspectives or frames their collaboration partners use. What can be witnessed as a consequence is a lot of confusion and miscommunication, where actors more or less assume they speak the same language, after all, they're all in the business of saving the climate, the globe. But in fact, are lost in translation.

In addition, there is a strong push of instruments into the problem area. Rules, procedures, schemes and even experiments are created to stimulate or regulate the market, to test or create new solutions. In most cases, there is no overarching orchestration of these instruments. As a consequence, it can be, and it often is a rough, bureaucratic and



frustrating journey. Due to regional differences for example, that hinder doing business on a national level. Or due to conflicting rules and extensive and bureaucratic procedures. In many cases, there hardly is any form of collaboration and various instruments are not in service of the journey of entrepreneurs and service business models.

Public authorities can and should facilitate the processes leading to a better understanding of the various paradigms and worldviews of all system actors and their activities. They need to make sure these interconnected activities are reinforcing each other in the collective aim of supporting entrepreneurs delivering services to the transition.

An essential element of such a way of working is trust. Long-term relationships must be established between actors that want to be part of the solution, (even if they do not know yet what that solution is), and trust that all parties are working towards the same common goal. Through collaboration and dialogue actors can identify the needs of all relevant partners and negotiate value creation. They need to work towards an inclusive perspective or even paradigm from which new approaches can be conceptualised. Policy makers and public authorities are very well positioned to facilitate this process of creating a new discourse with clearly mutually reinforcing activities.

The transition is better served when lack of governance and leadership is replaced by a sense of distributed ownership. Policy makers can drive this by taking a first step towards collaborative orchestration of repairing market failures.

As a final conclusion and recommendation, we address the issue of leadership, or lack thereof. Due to the complex character of the problem, the unknown outcomes (and thus responsibilities), and due to the heterogeneous group of stakeholders there often is no clear leader. Policymakers and public authorities often remain in their -passive- delegator role – like procurement, subsidising or initiating pilots. In practice, public system actors already are much needed as active participants. Therefore, they should position themselves as a proactive collaboration partner. Specifically, they need to take an active and leading role in creating an overarching collaboration strategy, as well as in being the director. In order to incorporate this role, they could attract savvy actors as their ambassadors, as well as develop transition skills themselves.

Many of the overarching activities described in the previous paragraphs can be seen as underdeveloped framework conditions or weak links in the innovation system. Failure that is detrimental for the energy transition and repairing these market failures is a clear role for policy makers and public authorities.



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