

Creating the big shift: system innovation for sustainability

By Stephanie Draper

#theBIGshift

Contents

Executive Summary

<u>What is system innovation and why do we need it?</u>	1
<u>Achieving significant change: Forum for the Future's six steps model</u>	2
<u>Applying the six steps to systems change</u>	3
<u>Lessons from our systems-change work</u>	4
<u>Conclusion and next steps</u>	5

Acknowledgements

This paper captures the thinking and experience of many people working at Forum for the Future and beyond. Anna Birney, James Goodman and Peter Madden have been particularly instrumental in bringing together the thinking in this paper, and it would not have been possible without them.

Thanks also to Louise Armstrong, Rodrigo Bautista, David Bent, Giles Bristow, Helen Clarkson, Santiago Gowland, Sam Kimmins, Madeleine Lewis, Jonathon Porritt, Betsy Reed, Sarah Severn, Ulrike Stein, Sally Uren, Penny Walker and the Forum System Innovation team who have all provided invaluable feedback, ideas, and support.

Forum for the Future

Forum for the Future is a sustainability non-profit that works globally with business, government and others to solve tricky challenges.

We aim to transform the critical systems that we all depend on, such as food and energy, to make them fit for the challenges of the 21st century. We have 17 years' experience inspiring new thinking, building creative partnerships and developing practical innovations to change our world. We share what we learn from our work so that others can become more sustainable.

System innovation is at the heart of our strategy. One of our key approaches is creating innovation coalitions, bringing together groups to solve bigger sustainability challenges - including those that work across whole value chains. Another of our approaches is helping pioneering businesses go further, faster.

Discover our stories and what we've learned about building a sustainable world at www.forumforthefuture.org, or follow us on Twitter or Facebook.

The Forum for the Future is a non-profit company limited by guarantee and registered in England and Wales.

Registered office: Overseas House, 19-23 Ironmonger Row, London, EC1V 3QN, UK.
Company No. 2959712. VAT Reg. No. GB 162 3473 19. Charity No. 1040519

Forum US is a fiscally-sponsored project of Tides Center, a 501(c)(3) nonprofit organization and the nation's largest fiscal sponsor.
Find us at: 261 Madison Avenue, 9th Floor, New York, NY 10016, USA

About Stephanie Draper

Stephanie leads Forum's work on the best ways to create change and impact. She has a strong background in change and now focuses on practical system wide change projects that bring together diverse groups of people to find creative solutions to tricky challenges (which is what system innovation is all about). She is an expert in collaborative processes, change and sustainable development and has worked with companies and industry sectors on making sustainable business happen for the last 15 years. In addition, Stephanie oversees our work on energy and Forum's expansion into India and South East Asia.

Stephanie's background combines science and change management. Following a Masters in Environment and Conservation, she worked at the Industrial Society specializing in strategy and change consultancy and set up one of the first CSR practices at the Work Foundation. She joined Forum in 2002. She is a trustee of the

Travel Foundation, a member of the Firmenich Sustainability Board and is the Co-Founder and Chair of the Sustainable Shipping Initiative. She talks and writes regularly about creating big change for sustainability.

In her spare time she likes to eat great food, paint and etch (that's printing) and can often be found in the great outdoors training for triathlons with her dog.

Twitter [@SDStephDraper](https://twitter.com/SDStephDraper)



Executive Summary

We need a big shift to create a sustainable future

Many of the vital systems that we rely on are not working

The food system is facing critical challenges, from the need to feed a growing population while coping with the impacts of climate change, to providing secure and affordable energy to all while reducing CO₂ emissions. We need to change these systems to make them more resilient, more equitable and able to continue into the future. At Forum for the Future we are trying to find practical ways to do this – something we call system innovation.

We define system innovation as a set of actions that shift a system – a city, a sector, an economy – onto a more sustainable path. This approach to big innovation is doable and necessary. Containerisation in the shipping industry in the 1950s is one example where an industry outsider recognised the need to move on from the dangerous practice of loading

ships by hand, and created a new standard container that eventually transformed the nature of global trade. And there many more examples, including those such as the Forest Stewardship Council¹ and LAUNCH², which are being applied to sustainability challenges.

Six steps to significant change

This process of change is reflected in Forum for the Future's 'six steps to significant change', which provide a simple framework for those trying to make an impact.

The major moments for system innovation are in the middle of the change curve – **diagnosing the system, creating pioneering practice** and **enabling the tipping point**.

1 <http://www.fsc-uk.org>
2 <http://www.launch.org>



Practical steps to create big shifts

Diagnosing the system means getting to grips with the sort of system you are dealing with and how it works – who holds the power, where is innovation needed and where are the key leverage points (i.e. places where concentrated actions could create multiple results)? At Forum for the Future we have broken down ‘diagnosis’ into practical steps that use ‘futures thinking’, such as visions and scenarios, system mapping, people-centred research and sustainability frameworks to really understand the system and identify where to act. For example, the Carbon Disclosure Project has ‘identify transparency and access to information’ as a key leverage point to drive better company and investor performance on carbon risk.

Creating pioneering practice is next – generating examples that demonstrate a new way of doing things. This may include new technologies, products and services, business models, changed relationships, markets or mindsets. To be pioneering it needs to:

- ◆ represent a new approach or new thinking that takes the system in a new direction
- ◆ have a clear prototype or pilot that demonstrates what success looks like
- ◆ respond to a systemic question
- ◆ be based on sustainability principles
- ◆ have the potential to be scaled-up.

Using this approach usually means asking specific questions, based on the diagnosis, to generate the insight needed to inspire new ideas and approaches that can be prototyped. The Sony Futurescapes project started as an exploration of how technology can enable sustainable lifestyles. It used future scenarios to think beyond ‘business as usual’. These not only provided a stimulus for innovation and a way to bring leading thinkers together, but also provided a means of understanding the technology system within which Sony was operating.

The concepts that emerged responded to different challenges within the technology system – from product obsolescence and wasteful use of resources to bigger questions about how well technology really supports people to live better lives.

System-level innovation is wide, involving new technologies, policies, communities and mindsets. It is also multi-faceted – you need plenty of parallel innovations to work together in a connected way to shift the system. Learning by observing the change happening in a system, and understanding how it impacts on people, is critical for it to work well.

Enabling the tipping point takes a good idea, product or service and grows or multiplies it so it has the biggest impact possible – i.e. taking something from niche to mainstream.

While there is no hard and fast rule on how to scale-up new ideas, we have captured the main techniques that we think are an important starting point for creating the conditions to scale pioneering practice:

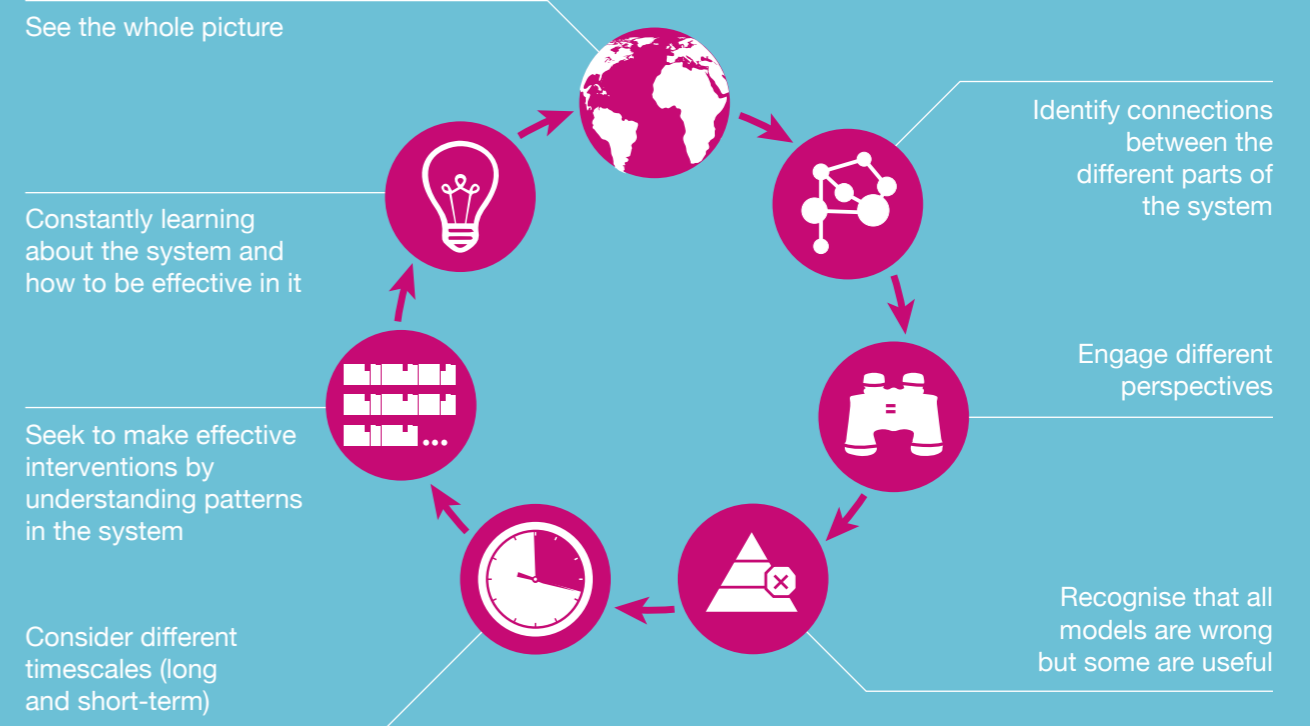
- ◆ inspire and enable influencers
- ◆ communicate & instigate behaviour change
- ◆ form networks and new collaborations
- ◆ incubate and accelerate entrepreneurs and technologies
- ◆ formulate new financial models, measures and standards
- ◆ remove barriers through policy and advocacy work.

These techniques are not mutually exclusive – inspiring influencers is intrinsically linked to communications, which in turn is key to creating effective networks. In the Community Energy Coalition we used a selection of the different pathways to scale (listed below) to create a coalition committed to promoting community energy with members and wider stakeholders. The vision was launched in

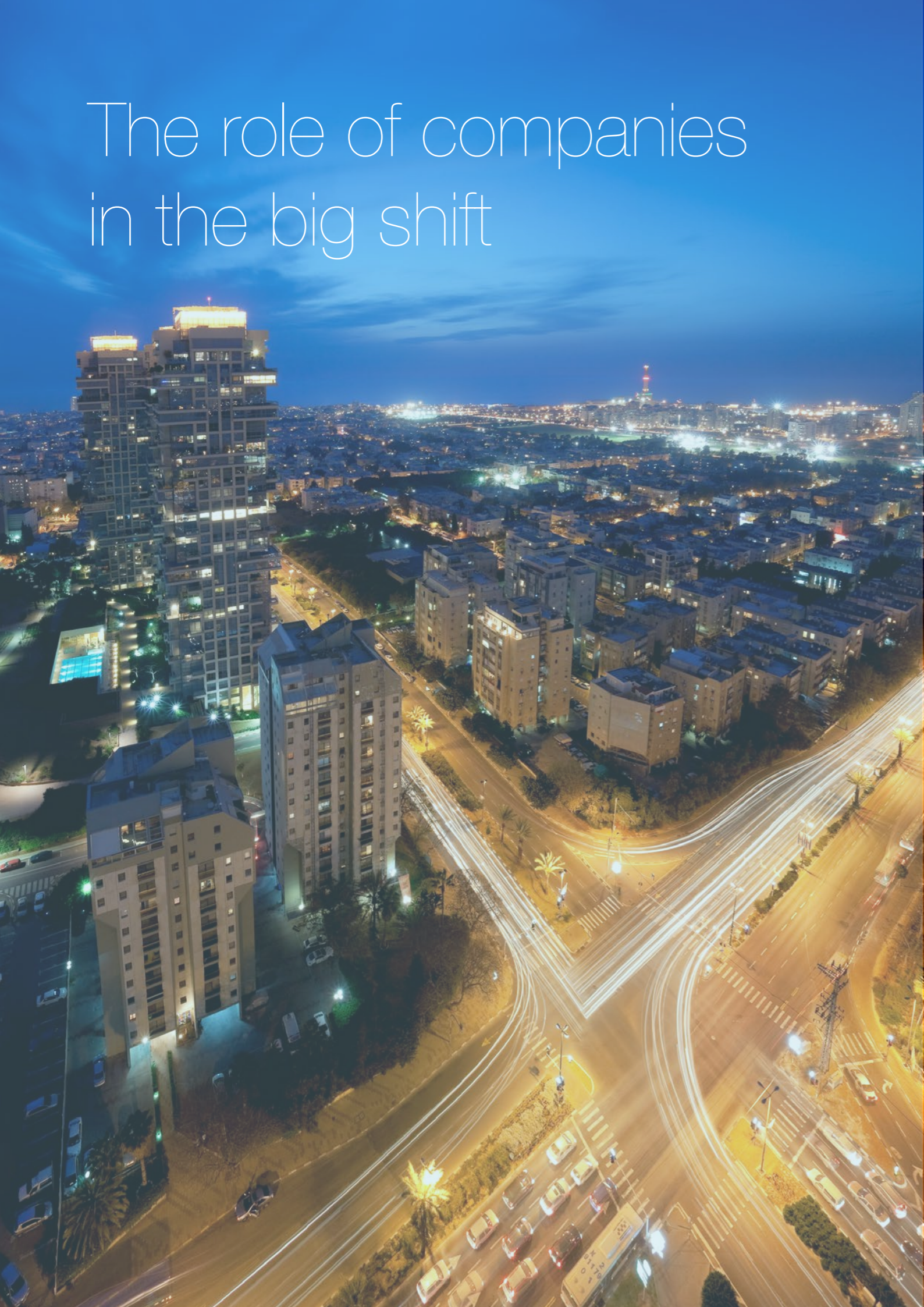
February 2012 at a round-table meeting on delivering community energy which brought together signatories and the UK Secretary of State for Energy and Climate Change. Understanding the scale you are aiming for, and combining some or all of these techniques, provides a pathway to increased scale.

Checklist for getting more systemic

As Forum for the Future focuses on creating shifts in systems to take us towards a sustainable future, we are learning a lot about how to make that happen. One profound thing we have learned is how important it is to think systemically on these sorts of projects. Peter Senge, a leading systems thinking academic, describes the systems approach as being a lot about the mindset you bring. Based on systems thinking, our checklist shows approaches that help make your work more systemic:



The role of companies in the big shift



The big shift involves a number of players, and one of them is big business

There are a variety of ways that companies can engage practically to shape their context. As pioneers of initiatives such as the Marine Stewardship Council (MSC) and the Round Table on Sustainable Palm Oil (RSPO), Unilever has been quick to see that it cannot source sustainably without change in the system, and taking action. Similarly Kingfisher's B&Q drove the creation of the Forest Stewardship Council.

In the early steps, companies can identify challenges and use their resources and convening power to help with diagnosis. Then they can undertake pioneer practice themselves, or foster it in others. While game-changing innovation generally falls to inventors and entrepreneurs, corporates can also play their part. They also have a major part to play in finding ways to scale-up innovations and deploying their resources to do so.

Nike is actively engaged in system innovation. This is because – in a business that contracts to around 900 factories directly and uses a palette of more than 16,000 materials – the volatility caused by resource scarcity and customer demands for transparency has the potential to disrupt profits in a big way. The response requires action that actually transforms the systems in which the company operates.

Materials present one example. About 60% of the environmental footprint of a pair of Nike shoes is in the materials. Nike's practical approach to shifting this system started with its own innovation, and developed the open-source Nike Materials Sustainability Index to help designers select better materials. But making information available is just the start – to get the level of innovation needed requires wider change in the system. To this end, Nike is using LAUNCH – its partnership with NASA, USAID and the US State Department – to accelerate a revolution in sustainable materials. This approach started by getting the materials system 'in the

room' to diagnose challenges and innovate – from green chemistry and closed-loop manufacturing to new finance and consumer engagement. The use of sophisticated game and system mapping helped chemical companies, brands, non-governmental organisations (NGOs) and thinkers really understand the challenge and find new solutions. These ideas, and others identified through the network, will be fed into the LAUNCH acceleration process so that the best ones can be developed and brought to scale.

Let's create the big shift together

This 'system innovation starter kit' is just that – a starting point for experimentation and learning. If we are to get to a sustainable future we need to be more sophisticated and joined up in the way we act. We need to get better at diagnosing systems and identifying the optimal places for focus. We need to ensure that actions are multifaceted – that a range of things come together at the same time. And we also need a way to address the barriers to change as a collective, rather than as separate individuals or organisations. We don't have time to make the same mistakes over and over again, so we need to learn from others and help others to learn from us.

We hope this summary helps you to diagnose, innovate and scale. At Forum for the Future we will continue to act, experiment and learn in this area, and plan to deliver further insights and tools over time. We are keen to hear how you are doing so that we can improve the process of system innovation, clarify what works and what doesn't, and collaborate with others to create more impact.

We want to create the big shift towards a resilient, equitable and vibrant society and a sustainable future. System innovation is the critical way forward in creating that shift. But we know that we can't do it on our own. Join us on this journey towards a sustainable future.

Let's create the big shift together.

What is system innovation and why do we need it?

As you read this, you are interacting with many systems: energy systems that heat and light your building; financial systems that move your money; transport and distribution systems that bring you products from the other side of the world. Our world is made up of complex, interlocking systems that have grown up over time – some planned, others accidental.

Vital as these systems are, many of them are not working. The food system is facing critical challenges – in the next 40 years we will need to produce as much food as we did in the last 8,000 years and deal with the impacts of climate change. In energy, there are pressures to provide secure and affordable energy whilst reducing CO₂ emissions.

For individuals and organisations trying to achieve change, the scale and complexity of these systems can be daunting. How do you shift these systems to make them more resilient, more equitable and able to continue into the future?

This paper outlines some of Forum for the Future's practical approaches to creating system innovation. We hope that, by sharing some of what we have learned so far, we can stimulate debate among the emerging systems innovation community, and help practitioners engage in systems change.

A definition of system innovation

Forum for the Future defines system innovation as **a set of actions that shift a system – a city, a sector, an economy – onto a more sustainable path.**

There are a couple of things to note from this definition. First, the set of actions is important. Systems change usually requires multiple interventions across different areas of society. It is very rare that a single person or innovation can change a whole complex system, such as waste or energy.

Second, we are dealing explicitly with systems. Of course, pretty much everything is a system of sorts – the human body, a garden, a company, a government. But we are talking about tackling tricky problems that are too large for any one organisation, however powerful, to solve on its own.

System innovation is driven by multiple factors. Technological innovation often plays a role, but this usually goes hand-in-hand with a shift in social attitudes, often supported by new financial and political power structures. The creation of the Forestry Stewardship Council and its certification label was necessary to help consumers drive sustainable forestry, but new forestry techniques and tracking technology, take-up from big companies such as B&Q and support from governments to enforce good practice were also needed.

Because of this multifaceted nature, system innovation is more complicated than traditional product or service innovation. But it has happened again and again throughout history. Electrification; the welfare state; mass production; social media; industrialisation of agriculture; the ready-meal; and waste recycling: these are all examples that show it is doable. However, in many of these historical examples, system innovation was unplanned and evolutionary – such as the change that happened with the rise of the internet. There are lessons to be learned from these examples, but we are more interested in orchestrated and deliberate systems change.

Examples of this sort of deliberate systems change often focus on changes in a city or a sub-system. The North Karelia Project in Finland is one example, described by Geoff Mulgan and colleagues in *The Open Book of Social Innovation*¹. This collaboration between local authorities, local people, experts and government resulted in a range of community-based interventions that successfully combined to reduce heart disease. It has led to the Karelia Health Service being reorganised around health prevention, and is also used to demonstrate pioneering practice in the rest of Finland. This is a great example of deliberate system innovation. It is focused on innovation at a leverage point – healthy living/ prevention. It is multi-faceted, combining policy, science and behaviour change. And there is a route to scale through demonstration, collaboration, learning and dissemination.

¹ Robin Murray, Julie Caulier-Grice and Geoff Mulgan, 2010. *The Open Book of Social Innovation*. The Young Foundation and Nesta, 2010.

Containerisation: A story of system innovation

The story of containerisation shows how a centuries-old system such as global shipping can shift through the scaling-up of innovation.

Initial challenge



In the early 20th century, ships were loaded and unloaded crate by crate. Ports were dangerous, chaotic and inefficient. The idea of putting goods in large boxes had been around for years, but the boxes were different sizes and heavy, and this simply added to the danger and complexity of getting goods into tightly packed holds.

Disruptive Innovator



In 1955, industry outsider Malcolm McLean (a trucker), recognised that shipping was part of the wider logistics system. He saw that containers needed to be easily and efficiently loaded onto ships, then offloaded onto trucks and rail at each end of the journey. He looked beyond the immediate problem to find a more systemic solution.

Tipping event



So Malcolm McLean innovated and designed a standard container – the Ideal X – that could then be carried by trucks, trains and retrofitted tankers. McLean subsequently shared his standards and patents for containers to ensure consistency and wider market adoption. Early take up was slow, with resistance from unions, ports and other shippers, but when the US Armed Forces used containerisation for the huge volumes of goods they were moving for the wars in Korea and Vietnam this proved that the practice could work on a large scale.

Incumbent business drives scale



From there, the increased speed and reduced cost generated by containerisation made it a case of 'adapt or die' for shipping operators and ports alike. Maersk promptly adopted the new approach, and its commitment and sheer size led to a tipping-point and the mainstreaming of containerised shipping infrastructure.

We now live in a world where 90% of our consumer goods come in containers. The seeds that McLean sowed in 1955 have grown into one of the core, central systems enabling our globalised world. Forum for the Future is now looking at how to make future systems changes to global shipping, through the Sustainable Shipping Initiative (SSI). This is working with a leading group of companies across the supply chain to find sustainable new practices for the shipping industry.



Achieving significant change: Forum for the Future's six steps model

The containerisation story tells us a lot about system innovation. As is often the case, it starts with an industry outsider or 'disruptor' seeing the need for change and innovating. But these first innovations don't necessarily result in major change: other factors are needed to create the scale needed to reshape a system.

This process reflects a classic change pattern – or 'S curve'. Innovation and change theory¹ often describes a process where awareness-raising and experimentation suddenly become normalised and mainstream. Forum for the Future's 'six steps to significant change' provide a relatively simple framework for those trying to create an impact. Clearly, change is not a linear process, and there is a need to go round a number of loops – such as innovating and then re-diagnosing – but we have found it repeatedly useful in designing change processes with our partners.

Put simply, change starts with understanding and aspiration. **Experiencing and understanding the need for change** is necessary to kickstart the process. This includes raising awareness of the challenges an organisation, industry or sector faces and needs to address.

Then we move into the system innovation phase, where new thinking and practical action are key. First you need to **diagnose the system** to understand what needs to change and where the best pressure points might be.

Creating pioneering practice is about developing and showcasing new and better ways to do things. This will involve multiple ideas – a number of which probably won't be practically achievable, but some of which might become the new 'containerisation' or FSC label. **Enabling the tipping point** is where things are able to start to scale; the ideas that are proven to work are taken up more widely by mainstream players and increasing numbers of people and organisations get involved. This step is often the hardest to make happen, as it is difficult to spot a place to start and to know how to go about growing impact within a wider system of players. However, this is critical for achieving a long-lasting impact.

The final two stages – **sustain the transition** and **set new rules for the mainstream** – are about embedding and spreading the change that has been created, as well as addressing the opposition that can build once new alternatives start to look viable. This commonly happens through widespread sign-up to voluntary commitments, new consumer standards or regulation.

System change happens throughout the curve, but the major moments for system innovation are at stages 2, 3, and 4 – between diagnosing the system through to enabling the tipping point. This is when a number of new ideas and approaches are catalysed, then taken up by the mainstream. We have therefore focused this paper on sharing practical insights on those three steps.

¹ Change literature such as socio-technical transition theory, transition management, human and cultural development innovation studies, complexity theory and systems dynamics.





3 Applying the six steps to systems change

Experience the need for change

Deliberate system change can't happen unless there is a sense that it is needed by at least a small group of people. The classic approach to this has been through literature and awareness campaigns – Al Gore's *An Inconvenient Truth* being a good example. Practically this is about engaging people, starting from where they are and providing them with the information, challenge and inspiration that is relevant to them – classic communications really.

At Forum for the Future we use a range of techniques to open people's minds to the need for change. We use Futures to influence mindsets. From our work with companies such as PepsiCo and Swire, and sectors or sub-systems such as dairy, fashion and tourism, we have seen how exploring different potential futures in depth enables people to better understand their current situation and system. When using scenarios, for example, from the outset we involve the teams we're working with in their development. They identify key issues, prioritise the most important ones and map out how they relate to each other. This enables them to see patterns in their current and future environments in which they operate, and to challenge 'business as usual'. One participant described this as "simplifying the complexity – being able to 'see the wood for the trees'". This can have a profound effect on individual mindsets too – which is critical in creating enduring change towards sustainability.

We also invest in education and capacity building, and use things such as the Sustainable Economy Framework to raise awareness of issues that need to be addressed. And we think that it is important to make the alternatives attractive and doable. A recent 'seeing is believing' tour for influential civil society leaders, for example, showed that community renewables was eminently doable, and often more attractive than the alternatives (page 30).

Diagnose the system

Diagnosing the system is about getting to grips with the sort of system you are dealing with and how it works – who holds the power, how change happens, where innovation is needed and where the key leverage points are. It is also about preparing people and organisations within the relevant sectors and systems to start the process of innovation and change, through building understanding of the nature of the challenges and the relationships necessary to create impact. According to Richard Rumelt in *Good Strategy-Bad Strategy*,¹ "A diagnosis ...



defines or explains the nature of the challenge. A good diagnosis simplifies the often overwhelming complexity of reality by identifying certain aspects of the situation as critical."

Forum for the Future has broken 'diagnosis' into three phases:

- ◆ **Inquiry** – identifying how the system works at a number of different levels and the key challenges that exist.
- ◆ **Opportunity and resources** – spotting the windows of opportunity and the people who want to work on it, along with undertaking a realistic assessment of the power and resources that you have as a change agent.
- ◆ **Prioritising** – deciding where to act and how to make sure you can deliver the most effective action.

¹ Richard Rumelt, *Good Strategy/Bad Strategy: The Difference and Why it Matters*. Profile Books, 2012.

The challenge of setting boundaries

Working out what you will and will not include in a project is difficult. All systems are inter-related and many are systems within systems. We need boundaries to make change achievable, but we also need to be aware that boundaries can limit perspectives and potential for innovation.

The Sustainable Shipping Initiative's (SSI) boundary was drawn to include all ships above a certain size and also ports (as key enablers) but not the infrastructure beyond. This was decided by engaging with people both inside and outside the industry, to see what they thought critical and practical. As a result, the SSI has a workable boundary that will enable change within the industry, but it also means that the SSI is not looking extensively at what is being shipped or how the whole value chain works, which may mean it misses the opportunity to create deeper change. Drawing boundaries is always an imperfect art, but it makes a project manageable, with clearly articulated limitations (as assumptions) that can then be addressed as you learn more about the dynamics of the system. It creates a starting point.





The inquiry phase

The first stage of diagnosis is about understanding the system itself, and identifying challenges. Taking a systems view is critical at this stage (page 39), as it sets the framework for action

Futures thinking is a great technique to help understand systems dynamics. Approaches such as using scenarios allow a group of people to look at the interrelationships between elements in the systems as they explore how they will play out in the future. This means a deep exploration of cause and effect, as a group. These are also incredibly effective at helping groups bring in different viewpoints and consider different timescales, which is important in systems thinking.

Developing a **vision** of the sort of system you want to see plays an important role at this point – in fact, being clear about what you are aiming for is a critical element of change, and collaboration to achieve that is a theme throughout the process (see box).

We also use sustainability frameworks such as **The Five Capitals**¹, **The Sustainable Economy Framework**² or **The Natural Step**³™ to help to assess how a system is (or isn't) contributing to a sustainable society, and what needs to change. These frameworks are systemic by design and demand a big-picture response, but they also allow

¹ www.forumforthefuture.org/sites/default/files/project/downloads/five-capitals-model.pdf

² horizons.innovateuk.org

³ www.naturalstep.org/the-system-conditions

people to break down the challenges into manageable chunks.

Another approach is people-centred research – where you go out and observe the system in action. This involves talking to people, understanding what they are doing and why, and using that information to better understand what is happening. This puts people at the centre of the system you are working on – something that is often overlooked.

Perhaps the best-known way into systems innovation is system mapping, where you look at the many inter-relationships within a system and reflect or pick out the most significant ones and the areas for leverage (see box for more on system mapping).

An effective diagnosis would probably combine a number of these elements before moving on to explore opportunities.

Visions to drive ambition

Collaborative futures projects such as Dairy 2030, Tourism 2023 and the Sustainable Shipping Initiative have shown us that **developing a vision** of the sort of system you want to see can galvanise a group. It gives it something to work towards together, as well as providing a shared sense of purpose and responsibility. Taking the time to build a strong group takes tenacity and commitment, but helps maintain that commitment and reach a more ambitious outcome.

A bit more about system mapping

In systems thinking, the classic approach to understanding a system is through mapping. There are many different types of maps you can use for slightly different purposes, for example:

System maps	What is the structure, purpose and boundary of the system and/or sub-system? How are value, information and power transferred within the system?
Stakeholder maps/ power dynamics maps/influence diagrams	Who is in the system and how do they relate to each other? Who is active and who is impacted? Who holds the power in the system and how does influence flow through the system? Where are the gaps?
Multiple cause diagrams/sign graphs/causal loop diagrams/system archetypes	Why has X or Y happened? Why is something the way it is? How do different actions relate to each other? Where are the areas you can focus on in order to create most change? What sort of reinforcing or balancing behaviour is in the system? What is happening to the system over time? What characterises this system (the system archetypes)?
Issues maps/cause and effect diagrams/ value chain maps	How do actions in a system relate to each other? What are the physical flows of a system? How is value transferred within the system? How does the supply chain work?
Rich pictures	Early inquiry into the system – where individuals and groups share their perspectives of how a system is working and what the challenges are, and then come together to debate and create a combined perspective.

Typically, a systems map will draw on a few of these elements. With the help of Marshall Clemens from Idiagram, the Zero Discharge of Hazardous Chemicals (ZDHC) coalition has done some work mapping how toxic chemicals occur in their supply chain. It's system map is a value chain map, overlaid with stakeholders and power dynamics.¹ Some of the brands have used this map to stress-test their own roadmaps to reach zero toxins, to identify gaps in their strategy and to deepen the effectiveness of their combined efforts. This map looks complicated, but as people worked with it, it enabled them to see the whole system on a single page and also test and understand each other's assumptions about how things work, and where the potential for change lies.

It is important to recognise that, when mapping, the process is as important as the final map itself. Maps are most useful when done by a group of people to build shared understanding and a view

on where the leverage points might be. (It is also useful to get different voices in the room to prevent groupthink.) They are of value because of the focus on inter-relationships and the way that different activities and people support each other (creating re-enforcing feedback loops) or limit each other (creating controlling feedback loops). These feedback loops are often where the keys to change are. Mapping also enables you to recognise a particular system pattern such as an 'escalation system' – nuclear proliferation during the Cold War being the classic example.² The type of action you might take varies depending on the nature of the system and also on what you are trying to achieve. For example, you might be trying to improve an established physical system such as the rail network, or innovating into a more open space such as the creation of the 'internet of things' – each of which would require different types of action.

¹ See www.roadmaptozero.com for a video explaining the system map and how it is used.

² These are called system archetypes - well described in Kim and Lannon's paper, 'Applying systems archetypes'. www.pegasus.com



Opportunity and resources

Once you have done your analysis and completed the inquiry phase you should have a much clearer idea of what the challenges are. Now you need to think carefully about where to take action

At this stage, it is also important to consider your own resources as a change agent. Environmental campaigner Chris Rose describes a 'feasibility triangle' that balances strong objectives, resources and activities to undertake an effective campaign.¹ If you and your allies lack the resources – which include power and influence, as well as finance and skills – then your ability to create change will be limited. That means either finding a way to secure those resources or deciding to focus your activities on something else. Nesta's knowledge/power matrix is also useful in considering this question, where if you have quite a bit of knowledge but less power, collaborative strategies work well.² But leadership strategies are more relevant in a system rich in power and knowledge.

Collaboration is key to any system change, regardless of the power dynamic. As the African proverb says, 'If you want to go fast, go alone; if you want to go further, go together'. If the challenge is bigger than one organisation, it needs a group to address it. Coalition building and group facilitation have always been a key part of Forum for the Future's work, and proper time and attention needs to be paid to it.

The Sustainable Shipping Initiative (SSI) showed that relationships and a high level of trust amongst members of the group impacts hugely on the success of an initiative.³ The group must be able to discuss things openly, be able to be confrontational if necessary, have difficult conversations and develop joint solutions. This level of group building needs time – ideally including informal activities as well as more structured sessions. It also needs individuals within organisations to commit to the process personally. Informal bonds among the SSI group meant it was easier to prioritise areas for action that the SSI now works on together.

¹ Chris Rose, *How to Win Campaigns: 100 Steps to Success*. Earthscan, 2005.

² Geoff Mulgan, *Joined-up Innovation*. Systems innovation discussion paper. Nesta, 2013

³ <http://ssi2040.org>



Prioritising action

The final step is to prioritise areas for action. Donella Meadows has identified 12 points to intervene in a system – each one taking you to a deeper level of impact




Changing the goals of a system – rules and laws, plus some of the unwritten rules, such as class or etiquette – is significantly more impactful than changing the way that current performance is measured, i.e. the parameters of a system. But changing the purpose and frameworks creates even more leverage, as it essentially shifts mindsets. When prioritising action, it is important to take the levels that you are acting at into account. This enables you as a change agent to create deeper and more effective action, but it does need to be balanced by the ability to actually act. In other words, it is

better to create change at one level and be able to go further (e.g. frameworks) than be unable to do anything at another (e.g. mindsets).

Other simple techniques for prioritisation include impact analysis and prioritisation, based on what people are energised to do.

At this point, you should now have a good enough understanding of the system and some ideas about the places at which you can begin your interventions. This is a great starting point for innovation. However, it is a mistake to think that diagnosis happens just at the beginning of a project. Learning is a key characteristic of system innovation and as you immerse yourself in a system, your understanding of it grows, and with it the quality of your diagnosis. Incorporating time to reflect on the issue on which you are working is important in ensuring that your diagnosis is dynamic, and will enable you to increase the sophistication of your approach.

Summary of the diagnosis phase

Stages in the process	Questions to answer		Useful tools, techniques and resources
 <p>Inquiry</p>	<ul style="list-style-type: none"> ◆ What are the boundaries that we are applying to this system? ◆ Who are the stakeholders and who holds the power? ◆ What are the big challenges that need to be addressed? Which ones are agreed and which are contested? ◆ How do the key activities of the system relate to each other? ◆ How has change happened in the past and what learning can we draw on? ◆ What would a better system look like? 		<ul style="list-style-type: none"> ◆ Stakeholder/futures interviews ◆ Horizon scanning and scenario creation processes ◆ Horizon – the digital tool using the Sustainable Economy Framework, horizons.innovateuk.org ◆ Dairy 2020 video and process: www.youtube.com/watch?feature=player_embedded&v=8wPxAb2XiQg ◆ People-centred research: www.ideo.com/work/human-centered-design-toolkit/ ◆ System mapping: www.youtube.com/watch?v=TQwA9krV8EA&feature=youtu.be ◆ Tellus Mater’s map of sustainable capitalism: https://dl.dropbox.com/u/92928788/Sustainable%20Capitalism%200.5.pdf ◆ Open University resources on different types of system map: systems.open.ac.uk/materials/T552 ◆ System mapping video: youtu.be/TQwA9krV8EA ◆ ‘The five whys’ – a simple technique asking ‘Why?’ five times to get closer to the root of a problem.
 <p>Opportunity and resources</p>	<ul style="list-style-type: none"> ◆ What have we learned about the system so far? ◆ What are the key things that need to change? ◆ What is the appetite for change and where is the new thinking? ◆ Where might the best intervention points be? ◆ What resources, relationships and power do we have to effect change? 		<ul style="list-style-type: none"> ◆ Forum for the Future’s change potential chart (Appendix 1) ◆ Single-, double- and triple-loop learning: www.kollnergroupp.com/wp-content/uploads/2009/11/Modes-of-Organizational-Learning.pdf ◆ System archetypes: www.pegasus.com ◆ Chris Rose feasibility triangle, ‘How to Win Campaigns’: www.campaignstrategy.org ◆ Nesta’s Knowledge/power matrix: www.nesta.org.uk ◆ The Sustainable Shipping Initiative Case for Action: ssi2040.org/what-we-do/case-for-action
 <p>Prioritising action</p>	<ul style="list-style-type: none"> ◆ How can we create the most effective change at a systems level? ◆ Where to do we start? ◆ What do people have the energy to take forward? 		<ul style="list-style-type: none"> ◆ Force field analysis ◆ Impact analysis ◆ Donella Meadows’ leverage points

Create pioneering practice

So now it is time to innovate

By pioneering practice we mean examples that demonstrate a new way of doing things. This includes new technologies, products and services, business models, changed relationships, markets or mindsets. To be pioneering it needs to:

- ◆ represent a new approach or new thinking that takes the system in new direction
- ◆ have a clear prototype or pilot that demonstrates what success looks like
- ◆ respond to a systemic question
- ◆ be based on sustainability principles
- ◆ have the potential to be scaled-up.

The innovation element of system innovation is a fairly well-trodden path. So the classic approach of identifying the challenge, inspiring new thinking, creating new ideas, and building new practice can be applied here. For example in Wired for Change we are bringing digital innovators together to tackle sustainability challenges. The community is armed with tools that enable fast prototyping and testing, which can bring the new ideas required to instigate system innovation. Bringing different perspectives and a fast coalition together around a problem can help unleash the power required for change.

Our experience to date suggests that three things are more critical for innovation at a system level than traditional product and service innovation:

- ◆ The nature of the innovation. For systems, it can be an idea, a mindset, a technology, a policy or a community, rather than simply a product. From a sustainability perspective, it will hopefully incorporate some radical elements to address the scale of the challenge.
- ◆ System innovation is characterised by being multi-faceted. This phase requires a number of parallel innovations, or for you to work in a connected way with others who are focused on the same system shift. Practically, that means looking at different combinations of technology, culture, behaviour, policy and finance.
- ◆ Learning. While all good innovation involves observation of how things are working and what is happening on the fringes¹, watching the change that is happening in the system and understanding how it is impacting on people is even more central for system innovation.

The Sony Futurescapes project started as an exploration of how technology can enable sustainable lifestyles. It used future scenarios to think beyond 'business as usual'. The scenarios provided a stimulus for innovation and a way to bring leading thinkers together, but also a means of understanding the technology system within which Sony was operating. The concepts that emerged responded to different challenges within the technology system – from product obsolescence and wasteful use of resources to the bigger questions of how well technology really supports people in living better lives. While focused on different areas of the system, the four resulting innovations describe a new platform, a new philosophy, a new product and a new place, and demonstrate the mix of actions needed to add up to a system innovation.

¹ Observation is one of Clayton Christensen's key characteristics of good innovation in *The Innovator's Dilemma* (Harper Business, 2011).

Summary of the pioneering stage

Stages in the process	Questions to answer		Useful tools, techniques and resources
Challenge	<ul style="list-style-type: none"> ◆ What's the big question you're looking to answer? ◆ What is the context that we are working in? ◆ What is the specific nature of the challenge? ◆ What are the shared challenges of the group? What needs need to be met? ◆ What assumptions are we making? 		<ul style="list-style-type: none"> ◆ Big 'How might we?' questions ◆ Sustainability frameworks, e.g. the Sustainable Economy Framework ◆ Consumer insight data or metrics, e.g. the London Data Store ◆ Group dynamics and facilitation ◆ Open and willing people ◆ Open innovation platforms, e.g. IdeaScale or OpenIDEO ◆ People-centred research: www.ideo.com/work/human-centered-design-toolkit/ ◆ Future trends
Inspire	<ul style="list-style-type: none"> ◆ How can we inspire people to think differently? ◆ How can you get people to think long term? ◆ How might we respond radically to the challenge? 		<ul style="list-style-type: none"> ◆ People-centred research ◆ Future trends and scenarios, e.g. Levi's fashion futures scenarios, Consumer Futures, FutureScapes: www.youtube.com/watch?feature=player_embedded&v=Qc6dYtWSoDw ◆ Weak signals and scanning of other people's ideas ◆ 'Seeing is believing' tours ◆ Varied stimulus: videos; personas; workshops with varied participants; external speakers and participants; analogous examples; data
Create	<ul style="list-style-type: none"> ◆ How many different ideas can we generate that could lead to something new? ◆ How can you realise/show an idea as a concept? 		<ul style="list-style-type: none"> ◆ Idea generation workshops and techniques ◆ Rich pictures ◆ Rapid prototyping ◆ Storytelling and story circles ◆ Improvisation ◆ Visual artists, e.g. Scriberia ◆ Run competitions, e.g. Gatecrashing the Energy Sector
Build	<ul style="list-style-type: none"> ◆ How can you bring your concept to life? ◆ Where can you pilot your idea? ◆ How can/would you take the concept to market? ◆ What do they look like in practice? 		<ul style="list-style-type: none"> ◆ Prototyping ◆ Consumer testing ◆ Incubation ◆ Piloting ◆ Business and financial model development ◆ Scoping phase ◆ Work with the right trust and relationship builders and people who are willing to bear some of the uncertainty and risk

Enable the tipping point

Enabling the tipping point takes a good idea, product or service and grows or multiplies it so that it can have the biggest impact possible – taking something from niche to mainstream. Importantly, for systems innovation, these need to be multiple; our analysis for the Shell Foundation identified three main types of scale – **growing**, **replicating** and **diffusing/influencing**.

Grow



To get scale you may **grow** something – be that a product, a company or an initiative. Airbnb, for example, is a platform for peer-to-peer room rentals. It began in 2008 with one office in San Francisco and is now a service offered in more than 19,000 cities and 192 countries – with a community of users that keeps on growing. This is a concept that has scaled geographically and a business that has grown as a result.

Replicate



The second route to scale is **replication**. Taking the Airbnb model of using digital technology and a platform to link up people with spare rooms, housebites uses a digital platform to match local chefs with hungry people who don't want to cook. It offers "restaurant quality food, cooked by chefs in your local area, delivered to your door". This is a replication of the Airbnb model applied to the evening meal.



Diffuse and influence

Diffusion/influence is the final route to scale – taking the essence of an idea or concept and spreading it through a variety of different routes. It is much trickier to define, instigate and control, as there are many ways this can happen.

For Airbnb you could define the core of the idea as peer-to-peer services, or the idea of using empty space productively, or something deeper. To get scale via diffusion/influence you would then take one, or many, of the elements and share them through education, business schools, the corporate and government mainstream or key influencers. A few examples include:

- ◆ Large companies expanding by taking over smaller organisations that can transfer knowledge, skills and ideas, e.g. if Holiday Inn adopted Airbnb – as Avis has done in buying Zipcar¹.
- ◆ NGOs or governments adopting and encouraging the best new approaches, e.g. Trip Advisor or development of new standards for peer-to-peer sharing.
- ◆ Inclusion of key concepts in education and key research – such as the sharing economy becoming part of the MBA syllabus or regularly featuring in the *Harvard Business Review* or the *Economist*.

¹ Zipcar is a car-sharing scheme that has recently been bought by Avis – one of the leading car hire companies.

When Forum for the Future worked with the National College of School Leadership, for example, we looked for multiple ways to create this diffusion/influence – from a policy paper to toolkits for head teachers to a community of practice sharing its learning. Jon McPhedran Waitzer and Roshan Paul from Ashoka – the social innovators' network – call this "scaling impact beyond the organisation" and see an open-source approach and smart networks as central to this sort of scale.²

Practical tools to scale-up innovations

Unfortunately, there is no hard and fast rule on how to scale-up new ideas. Research and practice suggest techniques that will result in increased

scale, and that combining a number of approaches and people increases the chances of reaching the mainstream. Importantly, these approaches need to combine hard and soft measures at an individual and collective level.

We have captured the main techniques we think are an important starting point for creating the conditions to scale pioneering practice. They are not mutually exclusive – inspiring influencers is intrinsically linked to communications, which in turn is key to creating effective networks. Understanding the sort of scale that you are aiming for, and combining a number of these techniques, provides a pathway to increased scale.

At this point it is also important to be able to let go, to see what emerges and support the strongest elements or organisations.

² Jon McPhedran Waitzer and Roshan Paul. Scaling social impact: when everybody contributes, everybody wins. *Innovations*, volume 6, number 2.

Summary of pathways to scale

<p>Inspire and enable influencers</p> <p>Scale starts with people – people transfer messages and motivate others. So to get to scale you need to inform, educate and inspire people. There’s the question of ‘who’ is important. Early adopters take up pioneering practice, but opinion formers, connectors and salespeople are the people who take an idea, product or service to the early majority and into the mainstream.</p> <p>Example: Forum for the Future and the Cooperative Group’s Discover Community Energy project was about showing the most influential UK NGOs how community renewables worked in Germany, to inspire them to make it happen in the UK. They were taken through a learning process as part of the visit. They had personal and shared inquiry questions and time for reflection and free writing. They told stories of what they had seen and explored together how that might be applied in the UK. These learning elements deepened the experience and, hence, the impact these influencers were able to have. The wider aim of the project is to bring alternative energy sources to scale through community networks. The resulting Community Energy Coalition has gone on to influence UK policy – securing and shaping a community energy policy – and remains committed to working together to secure a revolution in community energy.</p>	<p>Networks and collaboration</p> <p>Creating a network of people working on the same thing improves the chances of having an impact. Networks also bring together different projects to complement each other and add up to greater impact. Many of our projects start with collaboration to ensure that we are planning for scale at the beginning.</p> <p>Examples: Ashoka’s Globalizer Initiative is a cross-sector, tight-knit community that brings social innovators (Ashoka Fellows) together with senior entrepreneurs, advisers and business leaders. This community of practice is focused on getting more social innovation happening at scale.¹</p> <p>There are also numerous examples of different sorts of corporate-led collaborations aimed at achieving step change – like the B-Team² or getting wider take up of sustainable practices such as the Roundtable on Sustainable Palm Oil, the International Council on Mining and Minerals and the Better Cotton Initiative. These are most effective when they have big ambitions and combine businesses with government and civil society.³</p>	<p>Barrier removal and lock in – including policy and advocacy</p> <p>To get scale you need to remove barriers and ‘lock-in’ in the current status quo. Forum for the Future is taking a learning approach to capture the barriers and, with partners, explore how they interact and reinforce each other. This provides the basis for innovation platforms to address challenges such as perverse incentives, political blockers, high-fixed costs and many more.</p> <p>There are a number of consistent barriers that together create lock-in. The chart in Appendix 2 shows a number of elements that limit scale, which if removed could accelerate scale.</p> <p>Example: Forum for the Future’s Engineers for the 21st Century project started with an in-depth analysis of the system. The diagnosis showed us that education was key to this system, and so we worked to embed sustainability into the engineering curriculum to overcome that particular barrier.</p>	<p>Communication and behaviour change</p> <p>Communication is at the heart of scaling. Whether broadcasting outcomes or using a variety of channels to influence behaviour change, communications have unparalleled potential to amplify pioneering practice and create momentum. Through communications, we can let people know what’s worked and how they can themselves replicate new practice and bring it to scale.</p> <p>Example: M&S has been working to get clothes out of landfill. It has a partnership with Oxfam to take back clothes for resale or recycling. It has combined strong communications, Facebook and celebrities such as Joanna Lumley with incentives of vouchers to encourage customers to bring their clothes back to the store.⁴</p> <p>Similarly, Unilever has been working to help customers reduce their impacts through a range of behaviour change techniques (and great communications). Its approach is simply summarised in its Five Levers for Change video.⁵</p>	<p>New financial models, measures and standards</p> <p>We have found that one of the key barriers to scale is financing, so working with others to develop approaches that can crack access to capital, rebalance financial benefits across the supply chain and balance out benefits between capital and operational expenditure is critical. We also recognise that to really drive scale of sustainable ideas we need to measure and reward these things in a way that reinforces and cements these ideas.</p> <p>Example: The Marine Stewardship Council registers fisheries against sustainability criteria and allows customers to make informed decisions about the sustainability of the fish they are buying. MSC certification now accounts for 11% of the annual global harvest of wild-caught fish. This is an important tool in enabling critical mass and allowing major multinationals such as Unilever (one of the instigators) and Walmart to make big commitments to source fish sustainably and apply their efforts to increasing volumes and scale.⁶</p>	<p>Incubate and accelerate entrepreneurs and technologies</p> <p>Historically, lots of the big social and economic changes have been driven by entrepreneurs, like Martha Stewart, Anita Roddick or Mark Zuckerberg. Growing and supporting sustainable business is an important part of creating scale for sustainability where more sustainable products, services and business models can replace less sustainable ones. There are a number of tools and organisations⁷ that can help entrepreneurs grow and replicate their business models. This approach tends to focus on growing one that can really deliver an impact, but is of course linked to networks and communications to grow wider communities.</p> <p>Examples: There are a number of specialists that run incubation processes such as the Unreasonable Institute, Good for Nothing or Startup Bootcamp. Companies too are driving this process. Examples include Nike’s LAUNCH (see below) or O2’s Think Big which includes a process to promote young people with great ideas to make things better in their local community.⁸</p>
--	--	---	---	---	--

1 Jon McPhedran Waitzer and Roshan Paul, ‘Scaling social impact: when everybody contributes, everybody wins’ *Innovations*, Volume 6, number 2 provides insight to Ashoka’s approach and views on scale.
 2 bteamnews.squarespace.com
 3 www.rspo.org; www.icmm.com; bettercotton.org

4 plana.marksandspencer.com/about/partnerships/oxfam/shopping
 5 www.youtube.com/watch?v=iEaGM8kDac4

6 www.msc.org

7 See for example unreasonableinstitute.org or www.startupbootcamp.org
 8 www.o2thinkbig.co.uk

Combining efforts to increase your chances of scale

The chances of scale are increased by combining a number of techniques. At Forum for the Future, the Sustainable Shipping Initiative (SSI) does this in an attempt to create more impact across the industry.

Firstly, it brings leading organisations across the supply chain together to solve intractable problems. This has created a network of leaders who have worked together to identify the challenges and generate a vision for 2040. They are all committed to acting individually to deliver the vision, and to coming together to share their successes and address the bigger challenges together through innovation and influencing.

Scale in the wider industry is targeted through communications that highlight the leadership and genuine change taking place. Communications tactics include PR and peer-to-peer influencing and marketing to raise the profile of the SSI and inspire and compel others to take part.

The innovation programme focuses on supporting new technologies and removing major barriers. For example, we have identified split incentives as a major barrier to scaling renewable energy and more efficient technologies on ships. We are working with a small group of leaders in the industry to develop new financial vehicles that share risk, in order to overcome this challenge. This takes time, but we hope it results in solutions with longevity.

This is underpinned by ongoing learning about the system and understanding when other common barriers emerge.

The role of big business

Different players are critical throughout the process of changing systems. At Forum for the Future we have always had a focus on the scale, knowledge and influence that big business can bring to bear. While incumbents' stake in 'business as usual' makes them at risk of resisting change or finding it hard to be truly innovative, we have found that there is a business case for progressive companies to shape their external environment – based on differentiation, shared costs, reputational gains, long-term solutions and, importantly, leadership.

Many leading companies want to disrupt their status quo because they can see that sustainability issues are driving their operating context. Their long-term profits are at risk. If a big business acts now, it can protect the existence of its sector and enhance its competitive positioning. That is why many businesses we work with are focused on two parallel tracks:

- ◆ Innovating to win along that path, with new products, services or business models.
- ◆ Shaping their context, so we are all on the path to a sustainable future. Some companies focus on just their own sector, while others also look at the wider business system (for instance, the short-term focus of investors).

As pioneers of initiatives such as the Marine Stewardship Council (MSC) and the Round Table on Sustainable Palm Oil (RSPO), Unilever has been quick to see that it can't source sustainably without change in the system itself, and taking action. Now, through the Sustainable Living Plan and CEO Paul Polman's leadership on the need for long-term investment¹ it continues to drive ways to shape its

market. Other companies also have big ambitions. Kingfisher, the European DIY retailer, aiming to become Net Positive² openly acknowledges that this requires working with others to restore forests or create homes that are net energy generators.

There are a variety of ways that companies can practically engage to shape their context – acting on any of the 'six steps to significant change.' In the early steps, big businesses can identify challenges and use their resources and convening power to help with diagnosis. Then they can undertake pioneer practice themselves or foster it in others. While game-changing innovation generally falls to inventors and entrepreneurs, big companies can play their part – see our guide *Breakthrough Innovation* for tips.³ Crucially, big businesses have a major part to play in creating scale, as this is where resources can be powerfully deployed – through their trade bodies to supporting suppliers or reaching out to their existing customer base.

We are constantly learning about how companies can play these roles, through working directly with our partners. Our Sustainable Business Models Group also enables companies to explore together how to create step-change. To find out more, visit www.forumforthefuture.org/project/sustainablebusinessmodelsgroup.

¹ During the launch of the Sustainable Living Plan, Paul Polman, Unilever CEO, asked for investors who wanted a long-term investment model that was equitable, shared and sustainable. <http://www.unilever.com/sustainable-living>

² Kingfisher's commitment to being 'Net Positive' means giving more to society and the environment than it takes. For example, not just using sustainably sourced wood, but actively restoring forests too.

³ David Bent and Zoe Le Grand. *Breakthrough Innovation*. See www.forumforthefuture.org/sites/default/files/project/downloads/breakthrough-innovationexternal250612.pdf

Nike: a story of a corporate system innovator

Recently, Nike Inc. President and CEO Mark Parker said: "Innovation is most powerful when it's activated by collaboration between unlikely partners, coupled with investment dollars, marketing know-how and determination. Now is the time for bold solutions. Incremental change won't get us where we need to go. And it certainly won't get us all there fast enough. Nor at a scale that makes a difference. We are moving from an era of open innovation to one of systems innovation."

A business-led response

Nike is a company that is actively engaged in system innovation. Why? Because it has seen that its business model – based on abundant raw materials, cheap labour and endless consumption – will not sustain it in the long term. Challenges such as resource scarcity and climate change, alongside greater transparency and customer demands, are creating an unprecedented era of risk and volatility.

In a business that contracts to around 900 factories directly and uses a palette of more than 16,000 materials, that volatility has the potential to disrupt profits in a big way. The response requires action that actually transforms the systems in which they are operating.

Nike has form in innovating new systems. In the late 1960s, when Nike started out, running was exclusive to sportsmen. Ex-coach and co-founder Bill Bowerman wrote a book called *Jogging* that kickstarted a jogging phenomenon in the US, encouraging people to jog for fun and exercise, not purely for competition. At the same time, he was using his wife's waffle iron to create lightweight running shoes. As the waffle training shoe came on to the scene in 1974, all aspects of society were changing, and jogging became even more widespread. Ultimately, this created a mass market for Nike's products, but there were also real benefits to the health of society at large. The two have to go hand-in-hand to create a win-win situation for business and society.



Today, Nike sees that its core strengths of design, innovation, high performance and supporting athletes will thrive in a more sustainable market. And that by finding pre-competitive spaces it can benefit from wider innovation and collaboration – and the reduced individual operational costs and reputational risks this brings.

Nike has already invested in showing that sustainability can drive growth through product innovation. It now aims to decouple growth from scarce resources through tackling social barriers to change, and this needs a wider approach.

A system innovation strategy

Nike has a team dedicated to shaping the system around the company so that the business can be more successful in that system. Its system innovation strategy aligns strongly to Forum for the Future's six steps to significant change.¹ Nike's top-line approach focuses on the following:

- 1) Build the network and create an understanding of the system (diagnose).
- 2) Fuel the movement through working together towards a shared vision (vision and pioneer).
- 3) Shape the future with a focus on creating scale (scale).

Nike is currently applying this approach to a number of significant system innovation initiatives, working with others within and across its sector to create a market and an industry fit for the future.

¹ Nike and Forum for the Future have been working together on what system innovation means for a company, and Forum for the Future has helped Nike shape this strategy.

Transforming materials with a whole system approach

Materials, for example: represent a significant investment and impact for Nike. In the words of Hannah Jones, VP of Sustainable Business and Innovation: "About 60% of the environmental footprint of a pair of Nike shoes is embedded in the materials used to make them. When you multiply that across our business, and across the industry, it's clear that innovation in sustainable materials is a huge opportunity, not just for Nike, but for the world."

Nike's practical approach to shifting this system started with its own innovations and the Nike Materials Sustainability Index to help designers to select better materials. Nike has made this open source so that everyone can take up the approach – not unlike the Ideal X in the containerisation story. But they recognise that making the information available is just the start – creating sustainable materials is too great a challenge for one company to tackle on its own. To get the level of innovation in raw materials, rethinking manufacturing to create a closed loop, new chemical approaches, and access and engagement with the consumer requires much more pioneering practice and a shift in the rules of the system.

Enter LAUNCH, a strategic partnership between Nike, NASA, USAID and the US State Department that is already accelerating game-changing solutions to issues such as water, energy and health. It does this by announcing an innovation challenge and then sourcing and incubating the best ideas and businesses submitted. The Bioneedle is just

one example a biodegradable needle that delivers vaccines and then dissolves, allowing mass distribution and minimal waste. This business has been incubated through the LAUNCH process to share its potential and take it to scale.

Over the next seven years, LAUNCH plans a revolution in sustainable materials. The global apparel industry alone is worth US \$1 trillion a year, employing 40 million people. By 2015 it is predicted to produce 400 billion square metres of fabric a year – enough to cover California.² Changing apparel and wider materials used in space, aid and security will have significant impacts.

This focus on transforming the materials system started in April 2013, bringing together 150 experts and opinion formers in the materials supply chain to explore the challenges of the system, find leverage points and start to explore ways forward. This 'bringing the system into the room approach' used powerful techniques such as gaming and system mapping, and key players in the system worked together to diagnose the changes that were needed, identifying issues such as consumer engagement, mass innovation on land use and raw materials, green chemistry and closed-loop manufacturing.

The process of finding new solutions (creating pioneering practice), and possible formation of new alliances followed. These ideas and others identified through the network will be used to answer the Challenge Statement. Ten of the best innovations each year are fed into the LAUNCH acceleration process so that they can be developed and brought to scale.

² Statistics produced by the Materials Systems Laboratory at MIT for Nike.

But that is not the end of the process. The aim is that the network of the materials supply chain will continue to work together so that these individual solutions can combine to create a bigger shift in the system. And the network will also be a route to scale for these new ideas – taken up by the designers or manufacturers who were already part of the system.

A broad approach across their key issues

This is just one example of Nike's contribution to changing systems. It was also one of the key initiators of the Zero Discharge of Hazardous Chemicals (ZDHC) – a cross-industry grouping involving the likes of Puma, Adidas, H&M and Li-Ning in getting toxics out of the supply chain. And Nike is engaging in finding system-level solutions to labour challenges and getting customers more active too. Nike has seen that innovating to win goes beyond its products to shifting the system in which it operates.



Sustain the transition and set new rules of the mainstream

So you have created system innovation – pioneering practice that addresses a key leverage point and helped it to scale. That may be where system innovation finishes, but it is not the end of the change story. In order to maintain the type of system shifts we have described, efforts are needed to sustain the transition and cement them into a new societal approach – setting new rules of the mainstream.

We have already seen that the role of business (described above) can be critical in scaling, and effective commercialisation of an approach also supports sustaining the transition. Addressing resistance to new approaches is also important at this stage. As new concepts such as micro-finance and renewable energy gain traction, they tend to gain the attention of detractors who initially dismissed them as niche. Powerful lobbies can stall or completely derail change. This needs sustained attention, and this often requires new people and institutions to embed new practice into the

mainstream. And a number of the techniques used in scaling – such as communications and networks – are critical in this phase, but for a much more mainstream audience.

The final phase, setting new rules of the mainstream, is the moment of cementing a change. The most obvious evidence of this is a change in policy, such as the smoking ban in public places in much of the world, or the introduction of rigorous health and safety regulations. These things don't happen in isolation – they have to be preceded by shifts in attitudes and evidence that they will work. For example, the smoking ban in the UK was underpinned by public acceptance of the health risks and support from major hospitality chains. And sometimes these shifts themselves are enough – new social rules occur, such as the unacceptability of wearing fur – that they don't require regulation.



4 Lessons from our systems-change work

Forum for the Future has been working on creating a sustainable future for the past 17 years. More recently, we have been much more focused on creating shifts in systems that will take us towards a sustainable future. We are learning a lot about how to make that happen (and how not to) as we go along. The aim of this paper is to start to share this learning, and we plan to do this on an ongoing basis.

One profound thing we have learned is how important it is to think systemically on these sorts of projects. Peter Senge describes the systems approach as being a lot about the mindset you bring.¹ Based on systems thinking, our checklist shows approaches that help make your work systemic. This is useful when designing change processes, reminding us that different perspectives need to be brought

into a process through stakeholder engagement, for example, or being clear what assumptions you are making in order to keep your mental models in check.

Learning itself is another key insight. Given that orchestrated system innovation is in its infancy, by its very nature it is experimental, requiring the space for those involved to learn quickly from their mistakes and work out what is going to be most effective at scale. Incorporating observation and learning is vital. At Forum for the Future we use traditional evaluation techniques such as interviews and focus groups to gain an understanding of what is actually happening. But we have also found that insights groups, learning pathway grids and storytelling (as tools of action enquiry) tend to deepen learning and help explore issues, challenges and possible solutions.

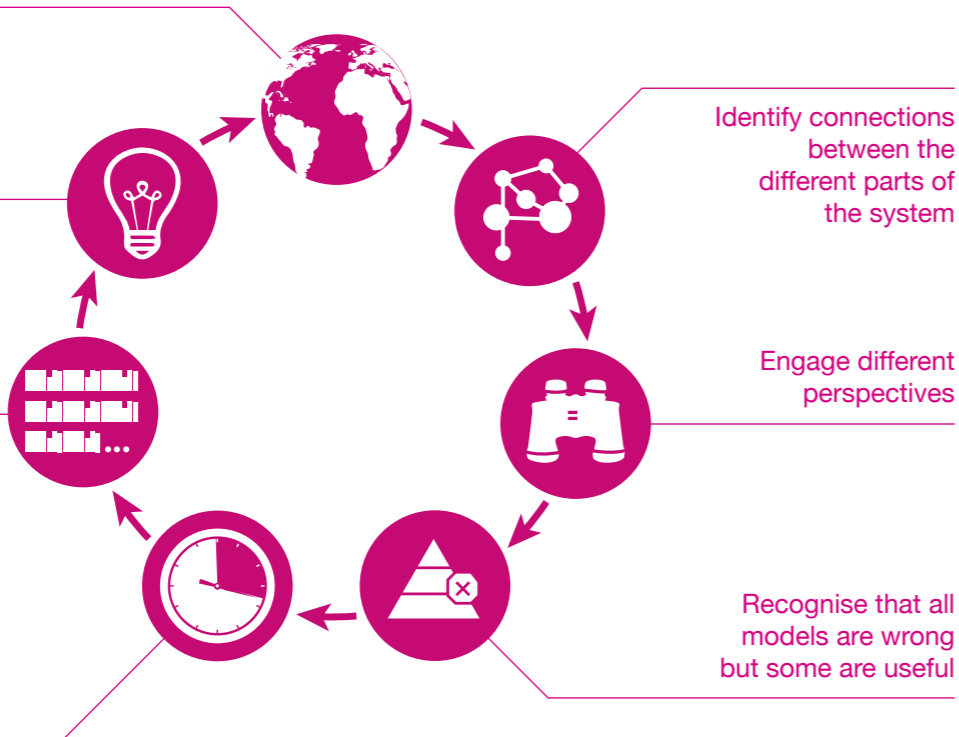
¹ Peter Senge, *The Fifth Discipline Fieldbook: Strategies for Building a Learning Organization* (Nicholas Breadley Publishing, 1994).

See the whole picture

Constantly learning about the system and how to be effective in it

Seek to make effective interventions by understanding patterns in the system

Consider different timescales (long and short-term)



Summary of systems thinking approaches

Elements of a systems approach	Questions to answer	Useful tools and techniques
Sees the whole picture	<ul style="list-style-type: none"> ◆ What's the most useful boundary? ◆ How deliberate (or conscious) are we in setting the boundary/scope for our analysis of situations? 	<ul style="list-style-type: none"> ◆ Change potential analysis (Appendix 1) ◆ Sustainable Economy Framework: http://horizons.innovateuk.org
Identifies connections between the different parts of the system	<ul style="list-style-type: none"> ◆ How can we better understand and capture how different parts of systems interrelate? 	<ul style="list-style-type: none"> ◆ Systems maps: http://systems.open.ac.uk/materials/T552
Engages different perspectives	<ul style="list-style-type: none"> ◆ How can we engage different perspectives? ◆ How can we better integrate the insights we gain from engaging different people and parts of the system? 	<ul style="list-style-type: none"> ◆ People-centred research: www.ideo.com/work/human-centered-design-toolkit ◆ Stakeholder mapping
Recognises that all models are wrong, but some are useful	<ul style="list-style-type: none"> ◆ What assumptions are we making? ◆ How can we keep them in check and challenge them when needed? ◆ How can we be more aware of the assumptions in our maps and models (theories of change)? ◆ What stories are we telling ourselves that might be simplistic or stereotyping some players? 	<ul style="list-style-type: none"> ◆ The Five Whys ◆ Donella Meadow's leverage points ◆ Peter Senge's <i>The Fifth Discipline Fieldbook</i> ◆ Double- and triple-loop learning
Considers different timescales (long and short term)	<ul style="list-style-type: none"> ◆ What are the implications for the long term? ◆ How can we overcome our 'blind spots' when it comes to long-term thinking? 	<ul style="list-style-type: none"> ◆ Futures
Seeks to make effective interventions by understanding patterns in the system	<ul style="list-style-type: none"> ◆ What are the patterns in the system? ◆ How are they changing? How are they blocking change? ◆ What is enabling change, if only a little (with potential to scale)? ◆ What sort of patterns happen over and over again in the system? 	<ul style="list-style-type: none"> ◆ System mapping ◆ System archetypes (see Pegasus Communication; academy for system change; and typology of sociotechnical transition pathways) ◆ Barrier identification
Is constantly learning about the system	<ul style="list-style-type: none"> ◆ Are we doing the right things? ◆ Are we doing things right? ◆ Are there any underlying assumptions that challenge our conclusions? 	<ul style="list-style-type: none"> ◆ Storytelling circles ◆ Double- and triple-loop learning ◆ Action research



Conclusion and next steps

Tackling complex challenges such as resource shortages, climate change and feeding the world at the scale and pace needed require a new approach. Through effective diagnosis, innovation and scale, system innovation provides a necessary and achievable way forward. At its heart are new ways of doing things – be they a fresh mindset or a new technology, combined with multiple actions in different areas of behaviour change, policy, finance and culture. We need this to create a big shift.

This ‘system innovation starter kit’ is just that – a starting point for experimentation and learning. If we are to get to a sustainable future we need to be more sophisticated and joined up in the way we act. We need to get better at diagnosing the systems and identifying the optimal places for focus. We need to ensure that actions are multifaceted – that a range of things comes together at the same time. That means more collaborations and bringing technology, policy, behaviour change and social norms together to reach scale. And we also need a way to address the barriers to change as a collective, rather than as separate individuals or organisations.

All this has to be underpinned by effective learning to deepen the change and enable others to apply that learning to their challenges. We don’t have time to make the same mistakes over and over again. We need to learn from others and help others to learn from us.

We hope this summary helps you to diagnose, innovate and scale. At Forum for the Future we will continue to act, experiment and learn in this area and plan to deliver further insights and tools over time. We are keen to hear how you are doing so that we can improve the process of system innovation, find out what works and what doesn’t, and work with others to create more impact in systems.

We want to create the big shift towards a resilient, equitable and vibrant society and sustainable future. System innovation is the critical way forward in creating that shift. But we know that we can’t do it on our own. Join us on this journey towards a sustainable future.

Let’s create the big shift together.



◆ Key actors and influencers

Who are the other stakeholders? How are they operating/seeking to influence? How co-ordinated are they?

Who are the key influencers of the current system? Who are the key actors? Where is the power? Who has the resources?

Where is the new thinking coming from? Who is generating new ideas? What is working well, and why? What are the potential breakthroughs?

Ideas and energy for change ◆

How has change happened in the past? What has driven it? What is driving it now? What has worked in the past?

The system
What are the boundary assumptions?

What are the major SD challenges? How significant are they (try to quantify)?

What needs to change? Where is that change needed? What are the tricky questions that need to be answered? (Be as specific as possible.)

What/who are the barriers to change within the system? What hasn't worked in the past and what can we learn from that?

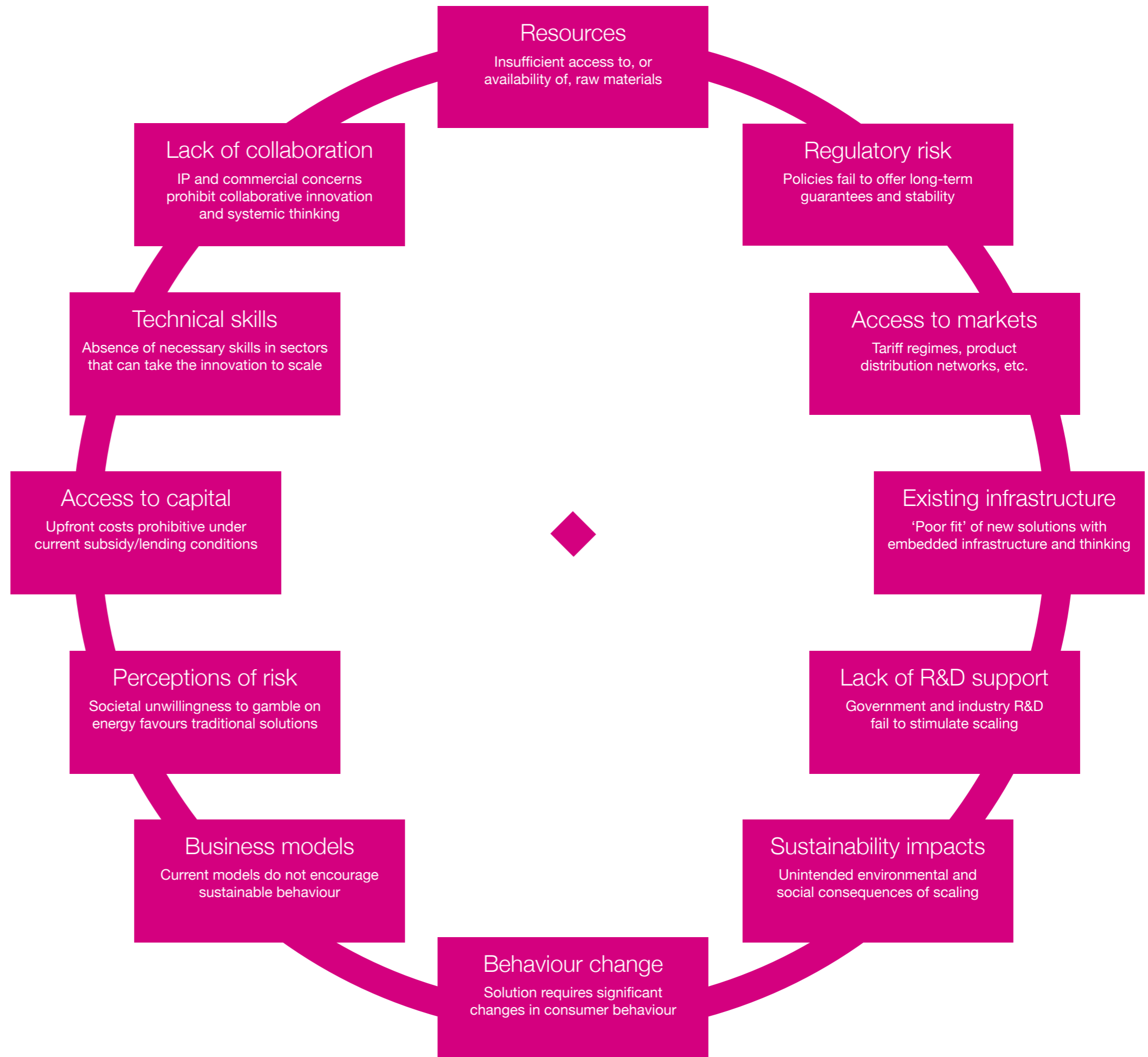
How ripe for change is the system? Are there significant pressures that we need to respond to? Where are the 'windows of opportunity'?

◆ Potential change outcomes

Change readiness (adaptive capacity) ◆

What do you want to scale, and what are the barriers?

Barriers often reinforce one another: remove one, and you can often remove or alleviate another.



Notes

#theBIGshift is Forum’s system innovation vision. We are working to solve the tricky challenges that block our path to a sustainable future. We want to shift entire systems, such as food and energy. We want to open up the conversation about system innovation and enable leading organisations to answer the question – how can I affect system level change?

We believe change is possible – join us to create **#theBIGshift** together.

Discover our stories and what we’ve learned about building a sustainable world at www.forumforthefuture.org, or follow us on Twitter or Facebook.

“Over the past decade Shell Foundation has sought to create scalable solutions to global development challenges. Our practical experience led us to recognise the different approaches required to achieve this goal, and the convergence in thinking with Forum for the Future’s ‘Six steps to significant change’ helped us clarify and frame our future strategy.”

Shell Foundation

“We need to move past the current incremental mindset into a genuine shift of entire systems. Otherwise we will walk slowly towards an environmental cliff. Systems innovation helps to take game changing solutions to scale faster. My team is fully dedicated to driving new ways of collaboration that can drive change at a system wide level. Forum for the Future has been a key thought partner in this journey”.

Santiago Gowland, Nike