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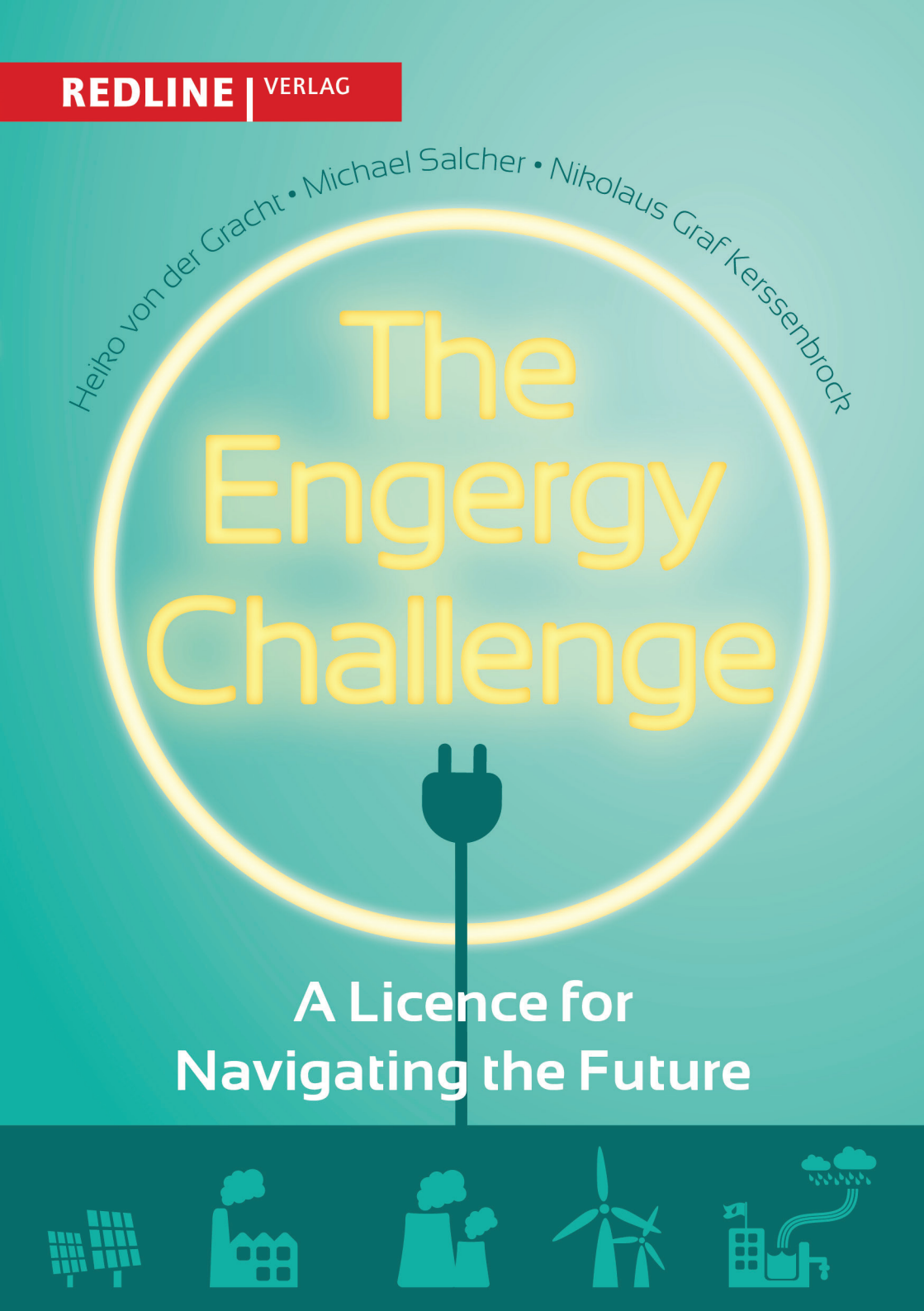
Heiko von der Gracht • Michael Salcher • Nikolaus Graf Kerssenbrock

The Engergy Challenge

A Licence for Navigating the Future



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Welcome

Shaping the Future!

New forms of energy, complex regulations, growing investment needs, volatility: the energy sector is facing a huge global challenge. The good news is that this situation provides unique opportunities of potentially historic proportions. It's also where the application of strategic creativity opens up previously unseen possibilities to positively shape a sustainable future for the entire industry.

Looking at the past tells us that times calling for radical change are also times of innovation. In particular, creativity is fuelled when crises make it necessary to rethink existing structures. The KPMG study "Energy – Quo Vadis?" marks the beginning of a series of publications, handbooks, studies and cases for future-proofing, published by the KMPG Global Energy Institute EMA. It provides decision-makers in the energy industry with professional support for taking a sustainable approach to opportunities.

This management book builds on the "Quo Vadis" study and shows how to implement a strategic foresight process by applying a toolkit of scenarios, wild cards, trends, uncertainties and more. The range of options is extensive, and is designed to facilitate intensive analysis and use of the challenges and opportunities that lie ahead.

Our goal is simple: to help companies deepen their skills in shaping the future of their organisations for a sustainable tomorrow.

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Preface to The License

"What is a government without energy? (…) Nothing – nothing at all."[1]

Mark Twain

Will the lights be switched off soon? No-one can be entirely sure, although we do know for certain that they have become more expensive to switch on. But customers are not the only people with reasons to complain; even suppliers are worried. Previously prosperous energy companies are fighting to survive and, in shades reminiscent of some old peasant rebellion, whole districts protest against power lines. Municipal energy suppliers and public utility companies are anxiously asking: which business model has a future?

The writing is on the wall. Everyone who is even remotely involved in energy knows that the energy sector is experiencing its greatest structural upheaval since Thomas Alva Edison. Never before in the history of energy generation and supply have higher sums been invested in new technologies, and nor have so many government programmes been redrawn in the face of such unprecedented uncertainty. Energy is vital. Energy is state-supportive. Energy is the business of the future.

Energy-related planning is not done in years but in decades. The figures are in the billions, not the millions. Thinking is global rather than national. Energy is the key topic of the coming decades for those with a future-looking mind. Up until now, the debate has tended to focus on questions like: where does energy come from, and how does it get supplied to the user? Now, however, we keep asking ourselves: will we be able to manage the change needed to keep energy flowing? Can we master the energy challenge?

People who follow this sometimes heated discussion can find lots of information. But there is always a nagging doubt that the lofty visions are not underpinned by any kind of masterplan. Not to mention the euphemistic term 'security of supply'. Too often, what we actually experience is hectic improvisation, disruption, and the permanent revision of plans which had only just been declared 'irrefutable'. This leads to greater uncertainty for everyone involved.

An angry sales strategist, for example, once complained in an informal round-table discussion that every driver is required to have a licence but that, unfortunately, no licence is needed to deal with the practicalities or politics of the energy industry. That is the crux of the matter.

Every day, many thousands of industry experts, politicians and stakeholders restlessly plan, calculate, control, politicise, decide, approve and invest daily for the energy of the future and the future of energy. But when it comes to the most important thing in our lives, the future, none of them have a license.

Of course this is not entirely true: There are certainly some expert futurologists in the meantime. But how many do you personally know?

Each expert has a degree, a certificate, a diploma for his or her professional specialisation. For the energy future, though, we have none. It's therefore the reason for writing this book: as a licence for the future.

As we know, being issued a licence for any vehicle is evidence of the holder's ability to master a complex machine in what is usually a multi-dimensional environment. Similar to the energy industry, in fact. So it makes sense to concentrate on the machine (your own organisation) and the environment (the market) in aiming for your own 'licence'. Our aim with this book is to make sure that, by the time you've reached the final page, you will have earned your licence for future competence. This energy licence is for board members and leaders, managers, strategists, sales experts, marketing managers and directors. In other words the decision-makers of today and tomorrow.

Are you ready for your first driving lesson?

1

You Can't Manage What You Can't See

"Every generation needs a new revolution."

Thomas Jefferson, Third President of the US

The right tool at the right time

When you discuss the future with decision-makers in industry and politics, at some point there is always an objection about its invisibility: nobody is able to see the future. How can you manage something that you can't see?

It is true that none of us has ever seen the future – with the exception, perhaps, of Nostradamus. But this is precisely the reason why decision-makers use tools to make the future visible: for example, prognoses.

Everyone has at some point followed a trend extrapolation, which has been created for an annual budget or a sales prognosis for the next quarter. Everyone has also at some time peered into the future while packing their holiday suitcase. What will the weather be like? Better play it safe and take that warm sweater along. Do you really think that these examples are poor methods of forecasting? You may be surprised.

On the other hand, you probably aren't surprised. You know only too well how it works in practice. Decision-makers confirm time and time again, for example, that they do not consider trend extrapolation to be the most innovative and reliable method. But it does provide an initial point of reference and it's fast and cost-effective. Or is it? That is precisely the problem. It isn't, at least not in every case.

In a relatively stable environment, linear extrapolation of a trend can provide a relatively reliable view of the future. This is because the formula for the future is: more of the same, same old-same old, time stability hypothesis. Can you see the logical error?

We know that we are living in times of dynaxity – in other words, a period that is simultaneously extremely dynamic and highly complex. Some even speak of a VUCA era – an age of volatility, uncertainty, complexity and ambiguity. On the other hand, we apply methods of forecasting that only function in a stable environment?

Methods like trend extrapolation don't work in turbulent times.

In turbulent times, the 'king of the hill' is not a trend, but a structural break, a strategic surprise and the wild card (more about that later).

What does that mean?

Right tool, right future

Times have changed, but many still depend too strongly, and sometimes solely, on the old tools.

The application of inappropriate foresight tools does not generally lead to the awareness of their unsuitability, but to a false security, which brings wrong decisions.

In other words: the tool determines the result – "I am unable to loosen a spark plug from the engine block with a hammer"… Once this correlation is

understood, you can also better understand the prevailing conditions in the energy sector and in many other industries.

But take note: instruments like trend extrapolation are not inappropriate in principle. They also deliver reliable results beyond their actual validity limit – especially when combined with other instruments; for example, with some challenging scenarios and threatening ones, plus opportunity-promising wild cards. A combination of future tools? That sometimes creates problems in practice: combine how and with what?

The following pages provide a precise answer to this question. Those who know the answers are already on their way to getting their future licence. Chapter by chapter, you will run through a complete process of strategic foresight, which you can subsequently implement in your company – with excellent practice transfer. What you learn on your journey through the strategic foresight world is not an outdated technical concept, but a pragmatic and practically-tested application. It doesn't just look good; it is applied as best practice by a range of companies, for both the implementation as well as the execution of daily foresight work.

Those who use and combine the right tools receive the 'right' future.

This context is so simple that it is often misunderstood in practice. Many managers and politicians, as well as completely 'ordinary people', look into the future with the wrong instruments, because they succumb to illusions. We discuss and dismantle some of the most dangerous illusions below, while continuing to deal with them in later chapters as well, because they are the arch enemy of future management (scientifically seen, this type of an illusion is also known as a bias).

The pedigree illusion

Mercedes drivers are different from VW Bug fans … Members of groups experience a feeling of belonging – that is the appeal of groups, teams, departments, units, industries and companies. This does not necessarily mean that

members of the 'in' group think they are superior. But the choicer the pedigree and the genealogy, the harder it is for a person who is unqualified to resist this elitist temptation.[2] Even if you don't think of yourself as being special, concentration is usually subconsciously focused on activities and insights from your own group. 'Structural holes' are inevitably formed in the information flow from and to other groups.

Findings are automatically devalued without being considered, simply because they come from another group. Some topics are just as subconsciously over-valued. A group, an industry, a company gradually becomes a closed system, which starts to stew in its own juices. It's a dangerous situation which, fortunately, usually does not last very long, since it leads to the abrupt end of your business model.

In contrast to this, success depends on closing up the structural holes in the information flow from and to the group, making the system more open, recognising and avoiding devaluing due to reflexive responses. It also cautions 'don't take yourself so seriously', as the popular saying goes, which was a well-known aspect of the pedigree illusion in noble and feudal societies.

The horizon illusion

Some time ago we conducted a study with the title "Energy – Quo vadis? 2035^{Plus}: Scenarios for tomorrow's energy sector".[3] One of the first reactions we received from decision-makers was to question the time horizon. Many practitioners asked what the sense was in looking so far into the future. They would have preferred selecting a period of five to eight years. That is interesting.

If you yield to this idea and conduct a scenario study on the developments within the next five to eight years, the findings for all industries are consistently as follows: the processed differences between the scenario world and the status quo are often microscopically small. The thing that relieves and pleases many (the purpose of every illusion) is that the future doesn't seem

very different from the present. The view into the future doesn't reveal anything revolutionary. The legitimate conclusion: keep everything just the way it is!

This is the wrong conclusion – especially when the present is being ploughed up by severe upheavals. The message seems to be: the short-term perspective levels the future to the status quo. It can be fatal.

Regarding the future, we don't need cognitive myopia; what we need is an out-of-the-box perspective.

Out of the box means: to look beyond horizons; to break out of your own, usually subconsciously imprisoned thoughts; unconventional, lateral thinking; and, above all, allowing things to happen.

"Before you can think out of the box, you have to start with a box."[4] Twyla Tharp

For this reason, it is wise to regularly take a good, hard look into the very distant future. When the time comes to transfer this long-term knowledge to your own company, then it is appropriate, important and purposeful to switch to the short-term perspective. There is no 'better' perspective. On the contrary, the following applies:

A person with future competence combines long- and short-term perspectives: those who see more, see better.

What distinguishes future-competent decision-makers is that they know how to perform perfectly within the various time horizons and don't look forward just five years if they can think ahead 20 years and longer.

This best practice ability, however, seems to be unequally distributed. Current KPMG analyses indicate that, in particular, major oil companies, exploration and mining companies work with scenarios. In comparison, the value-creation steps in the supply chain which are located further from the 'source' in the direction of the 'sink' are much less likely to be subject to scenarios and related tools of strategic foresight. This applies especially to en-

gineering offices, suppliers and municipal energy suppliers. One could call this phenomenon an industry-specific supply chain paradox.

Let us note: in regard to future competence, there is less need for a particularly far- or clear-sighted perspective, but more for an integrated vision of short-, medium- and long-term perspectives – and for registering the interactions of events. This is the way that a future-competent individual sharpens his or her understanding for the future.

The study illusion

Of course, any reasonable decision-maker no longer relies exclusively on individual tools like trend extrapolation. Scenarios are among the yearlong best practice options here, even though they are unequally distributed across the supply chain (see above). In this context, the energy sector is still way ahead of other industries.

In fact, after its original use in the military, scenario planning was first used in the energy sector by Royal Dutch Shell.[5] And quite successfully, at that. So it is hardly surprising to observe the flood of scenario studies in the energy sector that have since followed. According to findings by the European Commission, among 900 analysed future studies in the years 2004 to 2008, the sector "Electricity, Gas and Water Supply" was clearly one of the top themes (ranking 2nd with 27 percent, behind "Manufacturing" with 34 percent);[6] and this trend continues, as proven by meta-analyses of previous climate, sustainability and energy scenarios.[7] The decision-makers in the industry have been quite spoiled by this flood in recent decades.

One could say that the studies were virtually presented to them on a silver platter by institutes, universities, consultants and from the political end. The result of this scenario paradise was not, however, prognostic validity, but rather misleading security. This vanished when the premises of the applied scenarios were proven to be incorrect along with their underestimated pace of development. Besides, a prolonged stay in scenario-wonderland produced a *disincentive to learn*, comparable with the notorious

therapist dependency: with prolonged therapy duration, the client can become dependent on the therapist. The alleged solution becomes the problem, because it creates dependency. The same applies to the scenario-wonderland: if decision-makers are continuously bombarded with external studies, they unknowingly become too lazy to think and learn – which is exactly the opposite of what is required to form a qualified perspective on the future.

Competence is a journey, not a destination

What many people who are interested in the future of energy, their nation, family, community, own career or health don't realise is that it definitely *does* matter where a scenario originates. It makes a big difference *who* develops a scenario. If a university or a consultant presents a scenario, it may be exactly the same as the scenario developed by the future team in their own company. But there can still be a remarkable difference.

There is a huge difference whether a scenario is presented to you or if you create it yourself. The difference is a deeper understanding of the connections behind the formal description.

Awareness for futurology in general – and, in particular, a deeper understanding of the correlations in the scenarios – is completely different for decision-makers if they were involved in developing the scenarios.

A scenario is not just a view into the future. It is a learning process – right from the start.

That's why decision-makers should preferably be on board from start to finish. This benefits the decision-making process: it is much more difficult to reject a scenario, and therefore make a wrong decision, if you have been a part of its development. The reason is that those involved develop a better understanding and can better comprehend the inner connections.

A scenario is not a balance sheet.

I can read a balance sheet, even if I haven't prepared it myself – sometimes maybe even better. But the future is more complex than a balance sheet. The perfect example here is the most recent financial crisis. When some experts anticipated this quite accurately per scenario, an opposing view quickly emerged saying it wouldn't be all that terrible. Those who had created the scenario had a completely different opinion, because they understood how the mechanism - of impending financial collapse - behind the scenario worked. They were there when the individual parts of the whole were put together.

A scenario must be experienced and not just read.

But that is usually what doesn't happen when your own industry is flooded with studies of the future. You read, and take notice – and then it's back to business as usual. The next study won't be long in coming... and while you wait for the next study to arrive, you neglect your own scenario proficiency and future competence.

Sitting and waiting for the next study will not get you a licence for the future.

This applies to both the future and the licence for the future. Being present is not enough; the keyword here is *activity*. That's why the four scenarios for the future of energy (see Chapter 3) and the trend universe (see Chapter 4) develop their greatest benefits for strategy, innovation, risk management and communication; not from sticking their nose in a book, but from living and experiencing the transfer of scenario findings into actual practice. This transfer is absolutely manageable by best practice companies using available tools, which is often the case in practice – except that it's a bit quicker and smoother with external support. It depends, however, on when and if this support is wanted – a prerequisite that is certainly restricting in practice.

The illusion of accuracy

Controllers and members of strategy teams often object that they are already planning 20 years and longer in advance. There is no other way to do it

when millions in investments are at stake. Otherwise you'd never get a bank to come on board.

In the energy industry, it is common practice to plan the costs and amortisation of, for example, a gas turbine, down to the penny and 20 years in advance. This allows comparability of alternatives and suggests planning security… Security. A lovely word. And then you get hit by a Fukushima or the Ukrainian crisis or a 'surprising' legal amendment or any other of the countless structural breaks occurring today. Then the clever calculation has to be thrown into the waste basket. Many managers try to avoid that by having the best case, base case and worst case calculated, and point out that they have put enough effort into scenario planning.

This is where a word or two is useful about the different perceptions of the meaning of the term 'scenario'. What the person calculating calls a 'scenario' will be labelled something completely different by the futurist. We examine the difference in greater detail in Chapter 3. For the calculator, a 'scenario' is merely three variations of an exemplary amortisation scheme, while the futurist sees it as different social, political, economic, statutory and technological developments and their interactions – which could each result in different amortisation schemes. The complexity and diversity of such a (narrative) future scenario is much greater than that of a 'scenario' which is financial-mathematical.

'Scenario'? Check to see who said that.

What we are interested in here are not the – absolutely useful and necessary – financial calculation schemes, but rather the future scenarios. That is a strategic difference.

Flexible and agile

With the exception of gamblers, nobody loves risks and uncertainty. Until now, the energy industry tended to be chatacterised by high investments which, written off over decades, provided security and stability. These days

it seems like the opposite applies: the longer in advance planning and investments are made, the less secure the result and Return on Investment (ROI) seem to be.

In this context, DESERTEC comes to mind, or the lack of economic viability of many relatively new power plants following the energy transition and the decline in energy prices (in wholesale). The developments hit hardest those who had invested the longest and most extensively in the future. And that's exactly where the problem lies:

There is no 'one future'. There are only 'futures'.

Today, lack of security is not reduced with one 'sure bet', but by holding a hand full of as many good cards as possible – one for every possible, conceivable or desirable future. Only those who can (systematically) derive these alternative futures – the scenarios – have a winning hand. Regardless of which scenario or future actually materialises, being well-prepared allows for a flexible and agile response to all anticipated developments.

For this reason, it is extremely important to calculate not only the best, base and worst case scenarios, but to put to practise the 'What if...?' simulation in strategy groups and future circles. What if energy production were to be exponentially decentralised? If 90 percent of households were energy self-sufficient in 15 years? If targeted attacks caused the power grid to black out three times a week? If governments panicked and overregulated? If the Internet of Things skyrocketed electricity consumption? If projects that had been planned long in advance were suddenly massively boycotted?

Get your licence…

… or, if you don't like that name, simply call the certification of your future competence the Foresight Diploma or Future MBA. Whatever you want to call it, it is and will always be evidence of your future competence.

In the beginning, we promised to certify your future competence with this licence. And we also said that only those who have worked their way through the test sheet would receive the licence. Your test sheet is below.

What you'll find is, of course, not a series of typical test questions. They are simply concrete impulses and learning nuggets. The checklists can help you to sharpen your own awareness of the future. Use them as they were intended.

Of course, it will be easier for you with external support – but that's up to you. And another thing: if the long checklists below scare you off, you're still thinking in the wrong frame of mind.

Reframe yourself! Naturally, you could fish out the potentials and opportunities from each of the individual questions, nuggets, suggestions, comments and remarks. But that doesn't mean that you also have to improve everything immediately. Prioritise or cherry-pick because, in the future, all things are connected: if you start at A, you automatically touch upon B and C before ultimately landing at E and F.

Simply think of the following questions – and, sometimes, provocative interjections – as inspirations. If you've added the nugget to your bag or when you've implemented the suggestion, tick the box. If not, leave the box unchecked as a reminder.

Checklist: How strong is your current future competence?

Module 1: How to establish your instrumental basis

☐ We all look into the future. Sporadically? Regularly? How often do you look ahead?

☐ On what level do you look ahead? Only 'all the way up' at the executive level and in the strategy unit? Or are individual departments systematically thinking about what you do every day and whether it will be needed five or eight years from now?

☐ How many methods of futurology do you know? Five, 10 or even 20? (There are actually more than 30.) How many are implemented in your company?

☐ Do you select, evaluate and use methods of futurology regularly based on validity aspects? Does this or that tool even fit with the problem?

☐ What's the process like? Are planning, work and decision-making processes defined (in a handbook), so that decisions usually need to be safeguarded – for example, with methods of futurology?

☐ Who is actually responsible for such strategic foresight in your company? Or is there a designated competence expert with a project team?

☐ Maybe the tools have been adapted to VUCA times – but the minds of the decision-makers haven't yet changed? Do some of you still believe that the environmental conditions are relatively stable … ?

☐ … if so, that's atavistic and not a contemporary outlook, and it can only be changed with persuasive efforts. Be persuasive!

- ☐ Try out this little exercise (a scenario): pretend that you are at a meeting table with strategists and innovation managers and one of them says: "Well, we don't need future management. We're flexible; we can handle anything that comes." How would you respond to this reluctance?

- ☐ Never rely on only one futurology tool. Combine them, depending on the problem.

- ☐ Does your IT support your in-house futurists? Are you familiar with the term Foresight Support Systems, for example, or with prediction markets, Real-Time Delphi, predictive analytics...?

Module 2: How to eliminate common illusions

- ☐ Does your strategic foresight present a time horizon which is limited?

- ☐ Many look three to five years into the future – and no further. Are you just as unbalanced, only in the opposite direction?

- ☐ Adjust this balance periodically.

- ☐ Is the change of perspective practiced at all levels of the organisation, or just among senior management? And do individual participants and meetings get stuck on a time line – without being aware of it?

- ☐ Do you cultivate the strategic out-of-the-box perspective in particular? Do you encourage lateral thinkers, or is the tendency to perceive of and handle them as bothersome?

- ☐ Do you only rely on experts, or do you use the crowd effect and the 'wisdom of the crowd'?

- ☐ Do you mistrust calculations and investment plans that present you with cent amounts for 15 years in advance? They are practically false precisions by definition. Apply the underlying plans and calculations to

the different scenarios to see what happens. Even if these are only qualitative (without numbers, just with influencing factors), this will, paradoxically, be more accurate. That's because scenarios simulate trends, not just parameter variations.

☐ In this context, specify a definition for the term 'scenario' – to make sure, for instance, that someone who assesses three different oil prices doesn't get away with saying that they have presented three scenarios. You don't want to have us formulate an appropriate definition for you? Then it looks like you're well on your way to successfully completing this module.

Module 3: How to fulfil the requirements

☐ As we previously mentioned, it takes courage to whip your own future competence and that of your company or organisational unit into shape. We expect you to have this courage.

☐ If you come up against 'surprising' difficulties during the implementation of the future competence improvements that you have selected, remember that it was to be expected and indicates the obstacles common to change processes. Which specific obstacles do you recognise? Which do you foresee?

☐ One of the most frequent obstacles: lack of awareness.

☐ Lack of awareness for the future is one of the main causes of insufficient future competence. Work towards building and changing awareness. You'll find specific suggestions for this in Chapter 7 (The Transfer).

☐ Actively practice the patience paradox: globalisation is already so old, we live in a VUCA era, and structural breaks still catch us by surprise? That fuels impatience. At the same time, you should very patiently support yourself and your colleagues in achieving the appropriate future competence.