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Principles of a Democratic Energy Transition

ANNE-FRÉDÉRIQUE PAUL & MARC DELEPOUVE

What is an energy transition and why should we discuss how to accomplish one?

The current energy transition: a very specific transition that calls for an unprecedented approach

A transition is a **progressive phenomenon**. It can be viewed globally, but one observes **each individual element affected, their context and circumstances, the differences of speed in their development, and/or extent of changes**, which can sometimes be very great. An energy transition is one that has this dual characteristic because there are many different individual cases involving numerous and diverse actors. However, the current energy transition that we are discussing here is one that will **irreversibly affect everybody though in different ways**.

The energy transition we call for is also one to which **everyone should contribute in accordance with their means, for a shared collective goal**, one based on **mutual responsibility** for each and every person, now and in the future, here and everywhere.

Furthermore, a quick survey of previous energy transitions (the most dramatic being the transition from human and animal energies to wood and peat energies, then to coal energy, and then to petrol, gas, and nuclear energies⁵⁶) show how essentially different the current energy transition is. This transition has not begun with a breakthrough in energy production. Indeed, the previous energy transitions were **triggered by the emergence of the exploitation and generalisation of a new and more available energy source** that was at the same time:

- ▶ cheaper and thus more affordable to a wider range of 'consumers';
- ▶ more abundant – the abundance and the wider availability of the energy is a dynamic process, resulting from the interaction of geological, environmental, technological and, economic factors (which explains why the resource itself may not be as uniformly distributed as coal was during the first industrial revolution);

- ▶ more 'powerful' (i.e., energy dense) and more efficient (i.e., with greater energy efficiency);
- ▶ more flexible, especially through being storable and transportable, and thus adapted to the mobility of goods, persons, and information;
- ▶ conducive to the expansion and diversification of energy supplied to the end-users as well as of the services provided by its consumption;
- ▶ instrumental for the development of new energy services (that could play an important role in the socio-environmental system, such as the automobile does) in a dynamic and rapid manner;
- ▶ often a factor in lessening the environmental impact of other energy sources while creating new environmental impacts that were more often unpredicted and/or unobserved.

A brief analysis of the previous energy transitions show that:

- ▶ they were 'serendipitous' energy transitions, which occurred through happy coincidences, leading to the spread of an abundant energy form and the subsequent rise of (new) energy services, which are at the same time more intensive, diverse, and (potentially) available and affordable ;
- ▶ **they took place most frequently in a context and at time when new problems, limitations, or tensions emerged** (for instance, the limitations of oils available either from plants or from whales, in particular for lighting, was a problem that was obviated by the emergence of petrol);
- ▶ **they are highly 'path-dependant'** in the sense that they are the result of complex interactions between multiples factors, while, at the same time, they are also highly constrained by the past (the socio-environmental system and the socio-cultural context);
- ▶ they were influenced by, and in turn influenced, a wide range of socio-environmental conditions: they are at the same time the product of

⁵⁶ A broad overview can be had from the following books in Vaclav Smil, *Energy Transitions: History, Requirements, Prospects*, Santa Barbara CA : Praeger Publishers, 2010 ; Christoph Bonneuil and Jean-Baptiste Fressoz, *L'événement anthropocène: La Terre, l'histoire et nous*, Paris : Le Seuil, 2014; Roger Fouquet, 'The slow search for solutions: Lessons from historical energy transitions by sector and service', *Energy Policy* 38,11 (November 2010), pp. 6586–6596; or; Roger Fouquet and Peter Pearson (eds); *Energy Policy* 50 Special Section: Past and Prospective Energy Transitions – Insights from History (November 2012), pp. 1–7.

socio-environmental systems and the barriers and catalysts of a new and modified social environment;

- ▶ their effects were profound, lasting, and irreversible; thus they have huge impact on humans and their society; however, these effects are unpredictable, variable, and most often unfathomable at the beginning.

Each of these energy transitions was followed by major and irreversible changes both at the individual level (affecting our health, our lives, our standard of living, as well as our expectations and potentialities) and at the collective level (affecting our socio-economical organisation, our environment, and, more globally, the whole of our socio-ecological systems).

By contrast, the current energy transition, much discussed today but still embryonic, is completely different from previous transitions since it is both:

- ▶ **one that we want to carefully plan, having in mind a number of goals and associated stakes** (see chapter 1);
- ▶ **and one that is subjected to a number of constraints** (to name but a few: the problems posed by the recourse to either fossil or fissile energy sources, the climate crisis, growing health and environmental problems, the availability of energy services to each individual...).

Thus, to take any action that could prove effective in promoting an 'intended' energy transition, we should ask ourselves two fundamental questions:

- ▶ how should we proceed?
- ▶ and who should be involved?

A very specific and original process is called for in promoting and achieving a goal-oriented energy transition

Our current energy transition is a major and pressing socio-environmental issue in whose context:

- ▶ **important and irreversible choices must be made;**
- ▶ **and actions must be rapidly carried out** (see the article by Jean-Claude Simon in this section, Part 2).

Swiftly made decisions and rapidly undertaken action are needed if we want to prepare, mitigate, or, better still, prevent the major and disruptive foreseeable social and environmental damage (some of which has already begun) if our energy system remains on its current path – 'business as usual' or 'slight adjustments' will not work.

We insist that this urgent and major energetic system transformation requires a process that specifically promotes a 'desired' energy transition by and for everybody. That is why we are **convinced that a democratic energetic transition is essential**.⁵⁷

In the last part of this chapter, we will propose the basis of **an ideal process** to promote the energy transition. Some would call it utopian, and we agree: it will probably never exist, but it should be understood as a model towards which we should move and that we think would prove the most efficient.

This ideal process has the following characteristics:

1. It must be a **democratic, legitimate, integrative, and participatory** process.

It must respect the democratic ideal that each person who wants a truly participatory process is integrated.

Not only must it be open, it must also promote and facilitate the integration and participation of every person. Thus, at the same time, it is necessary to develop **individual and collective empowerment and create and sustain conditions that allow each person to participate** (not only on paper but in practice).

2. It must be a **multi-dimensional** process that combines:

- all the dimensions of the energy system and its socio-ecological context;
- **short- and long-term planning**, including both immediate actions that have direct effects while allowing (and facilitating) future actions;
- **individual and global planning**, allowing a diversity of individual transitions, which taken together contribute to the global transition.

⁵⁷ Some of our arguments converge with and/or are inspired, for example, by some concepts developed in Dominique Bourg and Kerry H. Whiteside, *Vers une démocratie écologique citoyen, le savant et le politique*, Paris: Le Seuil, 2010 ; and by Carolyn M. Hendriks, 'Policy design without democracy? Making democratic sense of transition management' *Policy Sciences* 42 (2009), pp. 341-368.

3. It must be a **pragmatic and efficient** process.

It must be **relevant** and **applicable** and it must allow for continuous **assessments** and **adjustments**. Thus this process needs an ongoing reflective and prospective monitoring.

4. And, finally, it must be a **humble** process.

We must admit that we cannot know everything, that we cannot predict everything (if such a thing could ever be possible). It follows that we have to prepare for the uncertainties and promote a culture of flexibility and agility in order to adapt to the current development of the transition. It also follows that we must keep on developing new knowledge, competences, and tools that could prove useful.

Consequently, we have the responsibility (and challenge) to develop a **process that not only allows us to act**, here and now, but also to **promote an ‘auspicious’ environment**, rich in potentials that could prove useful in an unpredictable future.

Why should it be a democratic process?

We strongly advocate for a democratic process because we firmly believe this is the kind of process most likely to succeed in promoting and achieving an energy transition that would be simultaneously be effected by everyone and be for everyone and would meet the goals set. This opinion is based on three central considerations laid out below.

First, a democratic process is one that is well adapted to dealing with a **complicated and global issue**.

1. Devising an energy transition needs **taking into account all the stakes**. It is important to avoid the pitfall of fragmenting the issue into different items, even though each one would prove easier to tackle in isolation.

As a result of a western mainstream ‘techno-scientific’ culture of governance, the main tendency today is to fragment a question, each sub-question being tackled as a single entity that can be dealt with by a specific panel of ‘experts’ in a more scientifically grounded manner. We can add that this tendency is accompanied by the practice of summarising any question in terms of numeric indicators, which are supposed to translate a complex, diverse, and changing reality into a couple of easily computed (and comparable) numbers through reduction and aggregation.

In these cases, the legitimacy of such proposals resides in a pseudo-objectivity backed by ‘top-notch’ scientists and experts⁵⁸ and by numeric indicators (numerals being seen as ‘objective elements’). The diversity of the individual contexts and trajectories and people’s values and aspira-

tions are discarded as being too relative, too unsubstantial, and/or too subjective to contribute to a proposal.

Alas, such lofty and reductionist approaches inevitably lead to a list of independent theoretical propositions (which apply to constructed indicators and objects, not to realities and people’s values and aspirations), propositions that are often contradictory, sometimes leading to outcomes opposed to the global aim and, unfortunately, sometime more adapted to a constructed model than to the actual reality.

Furthermore, such a practice, even with its appealing qualities of apparent efficiency and scientificity, is the surest way to erase the global outlook so needed for dealing with such complicated and global issues.

2. Secondly, we want to promote an **unprecedented energy transition**, one **aiming at broad collective and long-term objectives** (a ‘goal-oriented energy transition’), based on **values of responsibility, justice, solidarity, and socio-ecological sustainability**.

It follows that the past energy transitions cannot furnish models as to how to bring about the energy transition (and even for how to design a goal-oriented energy transition). However, it is self-evident (though the evidence needs voicing) that the past can help us in avoiding pitfalls and in designing realistic goals in accordance with our values. Lessons from the past should always be carefully kept in mind.

⁵⁸ We would like to emphasise that we are far from discarding the importance of techno-scientific and expert contributions (on this, see chapter 5, part 2), but we believe that they should contribute to and not lead the thinking/framing procedure (in accordance with Churchill’s point that ‘science should be on tap, not on top’, meaning that scientists have a duty to inform politics, but they have no special insights beyond that, and must allow politicians to formulate policy based on social, economic, and ethical principles). Science, technologies and expert advice bring essential contribution in three major areas: a) ways of knowing the world, b) ways of being in the world, c) ways of changing the world.

3. Finally, this goal-oriented process has the **double challenge of allowing each and everybody (provided they are willing) to contribute both to its elaboration and to its implementation.** A challenge seldom faced in our top-down culture of collective planning.

Secondly, a democratic process is, by essence, a process **with and for everybody**, that allows us to deal with an issue with which **everybody is concerned.**

1. Indeed, **everyone will be affected and everyone can contribute;** thus, everyone has a right to (constructively) express themselves.

Furthermore, **everyone has the duty to promote and ensure while, at the same time, benefitting from mutual solidarity,** implying both the responsibility to contribute according to one's own means and capabilities and the right to benefit according to one's own needs.

2. Correlatively, and as already stated, **everybody's participation is necessary** in the elaboration and the monitoring of the process because there are a **multitude of ways of framing the same issue** and thus to voice different goals and stakes. Indeed, it is essential to stress that any single issue is perceived from a wide variety of viewpoints, each affected as much by **legitimate values and perspectives** as by a **plethora of singular contexts, circumstances, and trajectories.**

An **integration** (which is quite different from the sum) of these different perspectives is necessary in order to think globally of this issue and its stakes and determine which collective goals are desirable and, hopefully, realistic.

3. Furthermore, everybody's (willing and constructive) participation is required for both the elaboration and the implementation of the process since **a diversity of competences** are needed at each step of the process, ranging from institutionalised techno-scientific knowledge to often discarded 'folk wisdom', and this includes competences linked to individual creativity, collective ingenuity, and the memory of historical, empirical, and institutional contexts.

Indeed, in dealing with such a complicated and global issue, affecting everyone in their lives, potentials, and aspirations, it would be a fundamental error to have sole recourse (as too often

occurs) to the contribution of scientists and experts (even in a truly inter-disciplinary and reflective way) and/or to 'authoritative' public or media figures (with or without a couple of 'open, participatory', public hearings, which are often mere tokens of good will rather than consultations to be actually valued and taken into account).

4. Finally, **everyone interprets and analyses the issue in a different way** in accordance with different cultural values, aspirations, and ways of life but also depending on different disciplinary perspectives, institutional interests, economic priorities, stakeholder negotiations, power relations, etc.⁵⁹ We collectively have the duty to hear all these interpretations and analysis; they need to be taken account because we need to mobilise the greatest number of willing contributors and because we know that everyone will be affected.

Thirdly, a democratic process is a **very effective way to mobilise and promote a sense of accomplishment and well-being,** which are all important in these uncertain and daunting times.

1. Indeed, **a global mobilisation is needed,** but without clear gains for sustaining the energy transition most people (already facing huge day-to-day challenges) will not be motivated to take part in it (especially since the rewards lie in the future and not very visible, more involve the collective than individual level, and since the project is daunting and implies undergoing major changes).

This is why it is important to **identify and clearly state the individual and social positive consequences that can be expected.** These positive outcomes should be stressed at least as much (if not more) than the deleterious socio-ecological consequences of doing nothing (which is the current trend in communication tending to a doom-and-gloom predictions if things go on as now).

It is also important to realise the impact of the **feeling of accomplishment and well-being** that can result from active participation in the designing and/or implementation of a goal-oriented, desirable energy transition. Indeed, some people may be motivated by a perspective of gains, but an even more powerful, and longer-lasting, motivation is to have a goal, a conscious feeling of accomplishment and well-being.

Taking part in a democratic process allows for

⁵⁹ These issues, such as the energy system itself as well as an energy transition, are all 'boundary objects' that leave much room for interpretation since they owe more to values and aspirations than to empirical facts.

both personal empowerment and active participation for ambitious personal and collective goals. Thus, participation is a reward in itself, a motivation and **a source of accomplishment** even if all the prospective 'gains' are not met.

2. Finally, returning to the roots of democracy, the final (and perhaps foremost) motivation is to promote conditions in which **each person feels that she or he is a member of society and that the society fully recognises her/him**.

This allows for the development of the fundamental **feeling of 'belonging'** (feeling that one has a place in society and that this place is recognised and uncontested by the society).

Correlatively, the development of a feeling of belonging is paramount in **promoting one's investment in the 'Common'** (all the natural or constructed entities that are shared and collectively managed⁶⁰) **and in a democratic process that allows the identification, preservation and promotion of the Common**.

It is therefore important to stress the advantages of participating in a democratic process, which, through swift and pragmatic decisions and actions, aims to deal with our current socio-ecological energy crisis while promoting individual and collective gains.

⁶⁰ We are referring here to one of the multiple definitions of 'the Common', one inspired by Pierre Dardot and Christian Laval that we think is the most comprehensive and unifying definition available; see Pierre Dardot and Christian Laval, *Commun; essai sur la révolution au XXI^e siècle*, Paris: La Découverte, 2014.

A new form of knowledge production, diffusion and usage is needed⁶¹

Joint problem-solving calls for a new form of the production of knowledge and of practices

The energy issue is one that needs 'joint problem-solving' approaches that involve the framing and formulation of an issue and the designing of strategies and processes to deal with it. Socio-ecological issues, such as the energy transition, are especially in need of these approaches since they are complex, global, and collective.

Joint problem-solving approaches have two fundamental characteristics that set them apart from other type of human activities:

▶ they are **goal-oriented**:

- these activities are firmly grounded in reality as they aim at **tackling present issues and problems** (and not only at enriching the debates around these issues and problems, wherever they may occur) and thus they not only enrich our knowledge but also **propose practical and effective action and contexts to deal with them**;
- they also aim at preparing for the future: **developing projects and ways to promote a 'desired and desirable future'** (orienting the future around specific and consciously chosen trajectories) as well as **expanding our potentials and possibilities** (not narrowing the future but widening it);

▶ they are **inclusive and integrative activities**:

- they call for the **integration of the most diverse and representative perspectives, knowledge, and practices possible** (here integration means not just the interconnection of data but also the emergence of new data);
- they **produce original and useable knowledge and practices**, and they **design effective and realistic strategies and processes** (their productions are original and, whatever their form, are far more than the sum of their parts);
- the issue being complex, this production works on two levels: the first level involves the production of a **wide range of proposals that are each insufficient but contribute to the whole**; the second level involves the production of a **global framework and overall strategy that ensure that each action is contributing to the final goal and nothing is left out**.

An inclusive, integrative and, situated activity

Dealing with such issues from a single perspective or with a limited set of competences and knowledge is inappropriate. The juxtaposition (or, better, the summation) of contributions is insufficient. Complex issues, and even more those that are global and collective, necessitate **the actual integration of all available perspectives, knowledge, and practices**, that is, the **inclusion of as diverse and representative a collection as possible**.

The final product, whatever form it takes, is necessarily original since this activity:

- **integrates different types of knowledge and practices** (the interconnection of existing elements),
- **co-produces new forms of knowledge and practices** (the emergence of new elements); and
- **has direct effects upon the socio-ecological system** (it is an 'interventionist' activity).

Crucially, the knowledge and practices produced should not only be grounded theoretically but above all be **deeply rooted in reality, in all its diversity and complexity**, since this activity is oriented towards the goal of tackling an issue and/or problem. This is essential especially for socio-ecological issues and problems, in order:

- **to envision not only their global and collective dimension but also the singularity of each individual context, circumstance, and trajectory** (situated instances);
- **and to situate the activity in and for humanity, our societies, and environments**, as well as to make proposals **for now and for the future**.

Finally, these activities should also support another important function in dealing with our socio-ecological challenges. This must also have a **reflectivity and analyse**:

⁶¹ These concepts are in great measure inspired by Ângela Guimarães Pereira and Silvio Funtowicz, 'Knowledge Representation and Mediation for Transdisciplinary Frameworks: Tools to Inform Debates, Dialogues & Integration', *International Journal of Transdisciplinary Research*, 1,1 (2006), pp. 34-50.

- the modalities of the **production of integrative knowledge and practices** ('internally-oriented reflexivity' as regards the activity itself in terms of asking: Is it efficient? Is it pertinent? Are we still on the right track and is the framing and goal still correct?, etc.);
- **the actual exploitation of the latter in real situations** ('externally-oriented reflexivity' in terms of the actual effects of this activity: Is it positively contributing to the goal? Is it sufficient? What are its effects upon human beings, societies, and our environment?, etc.)

The need for an extended peer-community for this new form of activities

Joint problem-solving needs the emergence of '**extended peer-communities**', which emerge and are shaped around the collective project of dealing with the issue and problems in question. These extended peer-communities are thus at the same time the product and the active force of joint problem-solving. These are **collectives aiming at a common goal**.

Members of such 'extended peer communities' are legitimate in the meaning that each member can offer something and each will learn something. Both the individual and the collective will benefit from such an activity, which, at the same time, produces new and necessary ways of dealing with our socio-ecological challenges.

These peer-communities are composed of (voluntary) **members that are the ones that make and develop contributions that are as diverse and complementary as possible**. That is why the **composition of this community is one that can only grow** as the activity continues.

They are peer communities since all have the same status: **it is not what the members are or represent** (either in the community or outside of it) **but what they actually contribute and do** (they contribution to the community and the collective problem-solving activity).

They are also a peer-communities since **each member recognises his/her belonging to the community** (and thus his/her motivation to usefully contribute to the common goal) **and each member is recognised by the community** (and thus respected as a contributing member, whatever part that member plays).

Notice that although **mutual respect and trust** in each other is fundamental, this does not imply that no rules obtain.

Finally, such a community needs to develop '**convivial conditions**' that allow for organisation, communication, and exchanges between the members of the collective but also between the collective and society (since we are dealing with a goal-oriented activity in and for society).

From community production to the actual tackling of issues and problems – and back again

Joint problem-solving aims not only at framing and formulating issues and problems but also at proposing ways of dealing with them. This activity would be futile if the propositions were not diffused and in practice made available to individuals, collectives, and institutions.

That is why extended peer-communities are work in and for society: their productions must be at the same time:

- **relevant**: contributions and useful for those people for whom it is relevant in certain times and places (here and now) while contributing to the global goal (which is sometimes hard to envision when one is deeply immersed in a single issue struggle) for now or the future (similarly hard to envision);
- **realistic**: efficient, applicable, and practical;
- and **useful for those people for whom it is relevant in certain times and places**: appropriable and transposable by the actors, according to the single, situated context, circumstance, and trajectory.

As already mentioned, dealing with socio-ecological challenges is highly dependent on individual contexts, circumstances, and trajectories (situated instances). Thus it is essential not only to integrate and produce relevant and applicable knowledge and practices but also to allow their appropriation by each person where and when they become useful and pertinent, which calls for **empowering conditions** that each could benefit people and to which each could contribute. Indeed, knowledge and practices **must be actually mastered and used in the various contexts and circumstances that are encountered**. Furthermore, if not already applied in a given situation, then actors should learn these practices and knowledge and adapt them to their actual circumstances, activities, and goals.

This contextual appropriation needs the development of **facilitating conditions** through:

- **mutual empowerment** among the members of the community
- **in situ 'buddy practice'**: 'compagnonnage' relying on networks for on-the-job transmission of knowledge and identities;
- and, when needed, **transposition to the individual situation and goal**.

Through appropriation and transposition, new knowledge and practices, new processes, and strategies will inevitably emerge. They will enrich the wealth of both society and the extended peer-community. This virtuous circle allows for the **continuous improvement of both**:

- the **joint-problem solving activities** (a permanent move towards improving the original proposals);
- **and the individuals and collectives involved** (enrichment, empowerment, and emancipation of everyone involved).

In a nutshell

To summarise, the energy issue, as with many socio-ecological issues, needs the contribution of 'extended extend peer-communities' that permit a new way of tackling these complex and vital issues.

These communities:

- ▶ **are dynamic and self-shaping collectives resulting from the cooperation of all the voluntary individuals who can make useful contributions to the questions dealt with:**
 - each question tackled contributes to the emergence of an extended peer-community whose members can permanently be enriched;
 - each individual can/should collaborate in a number of these communities, which must interact in a web-like fashion in order to enrich and strengthen all the collectives and thus tackle all the questions in a global socio-ecological framework;
- ▶ **each member benefits has equal status and is equally and recognised by his/her peers;**
 - commitment, humility, respect, and responsibility are key values.

These communities are necessary conditions:

- ▶ **for the production of new knowledge, practices, and ways of working together for a common goal,**
 - integrating not only scientific data but all the relevant data;
 - emerging from new forms of knowledge and practices;
- ▶ **for pertinent and socially-situated evaluations** of these new type of production and ways of collective and cooperative activity for a common goal
 - which require the emergence of new forms of assessments to analyse these novel types of production and of modes of production;
- ▶ **the appropriation and *in situ* transposition of these new ways of working in, by, and for society and of production, and of our environment** (that is, the effective and operational application, according to each case, its context and its circumstances and its trajectory);
 - these collective processes at the same time enrich the modalities and the wealth of knowledge and procedures to which we can potentially have recourse, as well as the individuals who participate, the collective (through their activities), and society (by dint of the transposition).

All of these functions need facilitating conditions:

- ▶ which must be **voluntarily developed, maintained, and enriched;**
- ▶ and **whose accessibility must be insured.**

The three advantages of democratic procedure

To summarise the lengthy (and we hope not too unpalatable) presentation, we shall try to outline the advantages of a democratic procedure in three complementary points:

▶ A democratic procedure is a **normative procedure**:

Democracy is a value we believe in and which we want to promote;⁶² and, up to now, we consider it is the best (or at least not the worst) system of social governance system so far adopted.

▶ A democratic procedure is an **instrumental procedure**:

It is probably one of the more efficient procedures for both the framing and the continuous

implementation of socio-ecological transitions.

It is also the procedure that provides enough flexibility to accommodate the different individual contexts, circumstances, and trajectories while aiming at a single collective and global goal (we could say that it allows for 'individual inconsistencies but global unity').

▶ A democratic procedure is a **substantive procedure**:

It is probably one of the more powerful collective approaches to promoting effective commitment to the achievement of 'better individual and collective outcomes' during both the designing and the implementation of a strategy.

It is also the procedure that allows for individual and collective empowerment and ongoing development of what has been achieved.

From 'energy system transitions' proposal to the decision process

The two 'pillars' of an 'ideal' democratic process

This proposition is based on two fundamental values:

1. The first value is our **individual and collective responsibilities regarding all the social and ecological issues**.

- This value implies the meaning of solidarity in which everyone shares our collective responsibility and has the duty to contribute according to his/her means and capabilities.
- This value also implies that everyone has the right to benefit from mutual support and a shared environment.

2. The second value is that the energy system belongs to the **Common** (as stated above, here we do not mean the 'Common' meaning 'common goods' but 'the system composed of each and every entity, collectively shared and managed', whether 'natural' or 'constructed').

- This value implies that the energy transition should lead to deep political changes with a '**commonification of the energy system**'.

Promoting an energy transition

Before presenting the process, we want to stress the fact that **any transition is a phenomenon that takes times**: it is a permanent process and never completely finished since an energy system is not a stable entity. On the contrary, it is a very dynamic process. Thus the goals will never be reached, but approached as closely as possible.

Furthermore, a **global transition happens in many places and has different rates of speed and forms** according to the times and places, the contexts, circumstances (including the current local energy system), and actors and persons affected.

This is not in contradiction with the fact that **all**

these changes, even though following different trajectories, contribute to a single global aim, with identical stakes and respecting the same values.

It follows that an energy transition aimed at a just and sustainable energy system based on collective responsibilities and solidarity is a **permanent process**. Setting a collective goal for the development of the Common does not preclude the fact that **flexibility is needed: flexibility during the whole process of change** but also **flexibility in the individual trajectories**. Indeed, if the total combination of all the individual trajectories is set, each individual trajectory is individual, presenting a diversity of paths, even allowing for some paths partially straying from

⁶² Even though a brief review of what is being said, written, or enacted shows that 'democracy' itself is a boundary concept that has a great variety of meanings and assumes many different and contrasting forms.

the collective goal due to imposed constraints resulting from some individual particularities. If the global path is established, each individual trajectory has its specificities.

Finally, **one cannot 'design' a transition**: changes will happen, but it is impossible to predict what every action will entail.⁶³ Thus one can only **facilitate a transition, orient it towards the set goals**, and 'nudge' its trajectory.

Thus a **permanent system designed to promote a desired energy transition** is necessarily a continuous system that not only launches the energy transition but also, and more importantly, follows it and makes any amendment to the decision deemed appropriate.

The different instances and phases of the proposed process

The framing procedure mobilises the citizens and:

- ▶ delineates the issue, clarifying what is at stake;
- ▶ identifies, analyses, and synthesises the wider aspects of information;
- ▶ advances a set of proposals, with their foreseeable direct and indirect consequences and including as comprehensive as possible a comparison of them;
- ▶ and, eventually, communicates the diversity of opinions.

It must also be stressed that this framing procedure must deal with the energy transition with **reflectivity**.

- ▶ This procedure must first be **reflective** and take into account the bias and errors. Humility is called for, and science and technologies cannot provide all the 'scientifically sound' answers and solutions.
- ▶ Far from being simply reflective, this procedure

must also be **inclusive**. This inclusiveness is twofold: as already stated, it must take into account the divergent framing of the issue but at the same time it must **take into account and shape the energy system and its socio-ecological 'environment'**, as aptly pointed out by Andy Stirling.⁶⁴

This inclusiveness is essential for dealing with issues about entities (such as the energy system), which are both constitutive and dependant on their 'environment'. Change to one will change the other, permanently altering the issue itself. One can say that **the issue is 'labile'**, some would even say **'volatile'**, always changing with sudden and unpredictable major transformations/mutations.

This inclusiveness is also essential for dealing with issues about complex constructed entities, for which the issue is as much dependant on the representations of the reality as on the reality itself. The framing of the issue results from a multiplicity of social values and aspirations that are themselves diverse and variable. One can say that **the issue is 'contingent and constructed'**.

This procedure is clearly a permanent one: its function is to launch the transition but is also – and this is probably its most important function – to follow, assess, and eventually amend the designed process that promotes the energy transition

Furthermore, this should be the procedure that is the 'leading' authority: this is the only structure that can at the same time:

- ▶ have a global view of the transition, which involves different individual trajectories all converging on the same goal, with the same stakes and based on the same values;
- ▶ has the capacity to make global proposals that

⁶³ This is quite analogous to the situation of anything that is new (for example, an invention) in a system, which can, or also may not, induce important changes to the current system. This 'transformation' of the system, in this case triggered by the wilful introduction of a novelty is called an 'innovation'. But if an invention can be wilfully designed and introduced in the society, its effects on both the population, the society, and the environment are in great part unpredictable.

⁶⁴ Andy Stirling, chapter 'Precaution, Foresight and Sustainability: Reflection and Reflexivity in the Governance of Technology', Jan-Peter Voß, Dierk Bauknecht, and René Kemp (eds), *Reflexive Governance for Sustainable Development*, Cheltenham, Glos., UK: Edward Elgar, 2006, pp. 225–272. 'Reflexivity (or reflexiveness) goes beyond the 'deep serious consideration of reflection. Dictionary definitions here yield the sense that attention "turns back on itself" (OED, 1989). By the mirror analogy, reflexivity involves recognition that "the subject itself forms a large part of the object" – as a matter of "self-awareness" (Giddens, 1976:17) or "self reflection" (Bohmann, 1996). Reflexivity thus requires attention not just to the "representation" of the object to the subject, but also to the way in which the 6 attributes of the subject help constitute the representations of the object and how these representations themselves can help recondition the subject. In other words, we face a recursive loop, in which it is recognized that representations are contingent on a multiplicity of subjective perspectives, and that these subjective perspectives are themselves reconstituted by processes of representation. As a result, any associated interventions are also simultaneously contingent on, and themselves help condition, a series of divergent but equally valid possible subjective representations.'

are pragmatic and reflective, since it is an instance that, hopefully, has the better global and long-term view (which includes the memory of the past and the vision of a desirable future);

- ▶ help the decision-making procedure to reinforce and exercise its legitimate authority since the decision is based on this 'improved contribution'.

The decision-making procedure is fully exercised by the legitimate politic authority:

- ▶ which **implements, supports (and sometime redirects)** a specific agreed-upon and desirable energy system transition;
- ▶ and which **aims at specifics goals** and is **guided by shared underlying values**.

The decision procedure defines the implementation phase and is remobilised each time decisions are needed (for instance, adjustments of the ongoing procedure, promotion of goal-oriented research, etc.). Indeed, as in the case of the thinking procedure, the decision-making procedure is necessarily a **continuous process**. It is also the only procedure in which decisions can be made that can legitimately alter individual trajectories and ensure that the globality of the contributions leads to the same collective goal.

The whole procedure is one that aims at a single 'collective strategic goal' while allowing for 'single inconsistencies' (meaning that single measures, depending on the context, circumstance, and trajectory in question, can be widely different in each case). Thus the decision-making procedure must be **prioritised above all others**, and its **legitimacy unquestioned** in order to have the full, and accepted, authority to orient the individual choices and trajectories.⁶⁵

⁶⁵ Note that the framing procedure does not necessarily require reaching a consensus (especially not a weak consensus that results from the smallest common denominators among contrasting values and diverging interests). Far from it, the framing procedure should provide a set of alternative (and eventually inconsistent) strategies, perspectives and possibilities, including their different arguments. The responsibility of making choices lies with the decision-making procedure, which is the only one that has the legitimacy to make choices and ensure their applications.

Furthermore, the development of contrasting proposals and the subsequent effort to aggregate them in a single 'collective strategic goal' is a condition that ensures the strategy adopted:

- will include a diversity of sub-strategies – a variety of measures could prove much more **effective and robust** in tackling the whole issue, especially when dealing with different contexts, circumstances, and trajectories and with a high degree of uncertainty and variability ('not putting all one's eggs in one basket');
- will have a high level of **agility**; having thought of different possible measures is important in facing particular (unforeseen) developments ('do not have blinkers on and trudge on in an inappropriately preordained track');
- will have a high level of **flexibility**; having thought of different possible measures is also important in giving up one specific strategy when proven unpractical or unsuitable ('no need to get bogged down by a wrong decision').

The continuous implementation phase:

- ▶ effectively launch and support the process;
- ▶ ensure continuous monitoring, evaluation, and forecasting of the process and the changes induced;
- ▶ proceed to the decided adjustment when decided/needed.

The implementation phase:

- ▶ is where the responsibility lies of **making and integrating the permanent monitoring, evaluation, and forecasting** that has been done in order to ensure that the whole process is working properly (indeed, as the transition actually unfolds, changes will have to be made to our strategies and actions in order to keep aiming at the set goals and to respect the underlying values);
- ▶ is where the responsibility lies of **designing proposals for adjustments**;
- ▶ is where the responsibility lies of **providing for the potential needs of the foreseeable near and far future**; thus it must work in close association with the thinking procedure.

For all the reasons laid out, we feel stress the fact the implementation phase, beside its active function in promoting and assessing the energy transition, has the function of **preparing the future** by continuously mobilising and/or promoting the development of (new) knowledge, resources, competences, etc. for future and probably unexpected developments.

Promotion of a facilitative and supportive environment

The whole process needs the promotion of **facilitative conditions**, which aim to help people, institutions, and legal entities contribute to and live with the energy transition. Numerous conditions can be enumerated, including material, legal, social, and other changes.

In the case of the energy transition, these conditions must include **changes that at the same time will affect the energy system and its place in our societies**. These changes include in particular:

- ▶ changes of the system and its place in the socio-ecological context: we will have to make changes to the components of the energy system and their interactions but also the interactions between the energy system itself and its socio-ecological context;⁶⁶
- ▶ changes of the dispositions: not only do we have to change the energy system and its context, but we also have to change the regulations and control procedures, the deciding authorities, the actors' roles and missions, etc.;

Complementarily, changing the system and the way it works can, in itself, create facilitative conditions (and/or 'facilitated' conditions, more conducive to the changes). However, facilitative conditions are insufficient when dealing with such global and interdependent issues. We also need to promote **SUPPORTIVE CONDITIONS** that help each person to live and to contribute to the transition

Supportive conditions would greatly benefit a variety of **personal and collective empowerment approaches** developed with and for the various social actors (which belong either to the energy system or to its wider context), and for every person, group, organisation, or institution (that will all be directly and/or indirectly affected).

These empowering procedures are instrumental in all the phases of the process leading a goal-oriented energy transition. They can profoundly affect the individual and collectives representations and values, raise the awareness of individual and collective responsibilities, and thus prove crucial for a successful process, leading to desirable changes, benefiting everyone.

The empowering procedures aim to help persons, groups, organisations, and institutions to develop:

- ▶ the **awareness** to the energy issue and its relation to other topical and crucial issues;
- ▶ the **understanding** of and the **sensitisation** to these issues and the motivation to act;
- ▶ the effective **acceptance** that changes will happen (whether we act or not), and that it would be preferable to try and orient these changes, to which we will be subject to in the worst case

scenario, or, preferably, which we can influence to prevent, reduce, compensate, or accommodate the deleterious effect of our current energy trajectory;

Indeed, the energy transition implies changes that will (hopefully mostly) be intentional but also (inevitably sometimes) unintended, (hopefully largely) desired, and (sometime) suffered; changes which will radically affect everyone's values, activities, way of life, range of choices, potentialities, opportunities, etc. along with the societies and ecosystems. Thus it is important to develop the **will** and the **capacity** to change and to act, along with the effective **possibility and legitimacy** to do it.

The empowering procedures will inevitably affect:

- ▶ the entities (natural and legal persons, groups, organisations, and institutions) involved in the energy and the socio-ecological transition;
- ▶ all the structures and phases that are involved, in particular the thinking process that is continuously remobilised during the implementation phase, but also the political systems along with our perceived, accepted, and assumed responsibilities.

As a consequence, the empowering processes contribute to the meaningful engagement not only in changing the system, but also in accepting the implications of these changes for ourselves, others, and the ecosystem (that is to say, to take responsibility) and in working together to live together, here and now, but also everywhere and at all times (that is, to develop the all-important sense of solidarity and of belonging).

⁶⁶ Since the energy system both shapes and is shaped by the socio-ecological context, it follows that any change in one will affect the other.

Conclusion: behind the energy transition

Even though we are deeply conscious that the process presented here, being an ideal one, can essentially never be fully achieved, we are convinced that aiming at it clearly indicate that the undertaking of this 'collective journey' towards a shared future is essential for staying actively mobilised for the ultimate goal collectively set. This is **a never-ending journey** that we are undertaking together, a one-way trip to an unreachable goal that expands as we approach it.

This is why we must **permanently improve the trajectory of this energy transition** towards one which promotes an energy system that is **more just, more solidary, and more sustainable**, a task for which **we bear individual and collective responsibility**.

On the practical side, we believe that such a process appears to be the only that can deal with such global and complex issues, where uncertainties and unknowns are numerous, in which the stakes are high, in which values and interests are disputed, and perspectives are multiple while mobilisation and commitment are urgent.

Such a process is also one that can more readily lead to pragmatic and effective measures and their reflective analysis, which is necessary for its continuous adjustment. It is also one that allows more flexibility and adjustments to the diversity of context and circumstances, values and lifestyles, while aiming at one single collective goal.

It is also a process that can ensure the necessary individual and collective perception, comprehension, concern, motivation, and mobilisation to change and to act. Everyone's commitment is a necessary condition for making such a transition possible.

Finally, through its democratic dimension and the promotion of empowerment, including the development of the capacity, the power, and the legitimacy to act while developing a sense of solidarity and responsibilities, this process can only have positive effects for both world citizenship and democracy itself.