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Energy: prometheus bound or unbound? A conceptual approach

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Abstracts

Most contemporary debates surrounding technological development refer to the myth of Prometheus, which tells of how Prometheus stole fire from the gods to give it to humankind. This fire, or energy, is the means through which human beings are able to exercise greater power over their environment...and over one another. The myth, as told by Plato, describes how fire gave rise to *hubris* and caused great wars between human beings. Hence the two perspectives adopted in the contemporary debate on technology; some wish to see Prometheus act freely, thus allowing humanity to exercise the greatest powers possible over nature, and others would rather see Prometheus “chained once again,” judging that his power has become too great. However, less well known is the continuation of the myth: chaos impelled Zeus to send Hermes down to earth to bring *dikè*, justice, back to humanity, thus re-establishing peace. Indeed, the essential part of the myth is found in this often forgotten second part and not in whether or not Prometheus should be freed or chained. This article intends to draw from the lessons in this myth to analyze the geopolitics of contemporary energy. Following Ivan Illich’s analysis, it will be shown that moderation, or balance—as opposed to *hubris*, which describes excessiveness—is one of the necessary conditions underlying all global plans having peace as their objective. At stake in the energy debate is none other than the question of the distribution of power. This means not only debating questions of aggregate economic well-being but also legal questions (the right to development, the rights of future generations, etc.)

La plupart des débats contemporains autour du développement technique font référence au mythe de Prométhée. Prométhée a volé le feu pour le

donner aux hommes, et le feu, c'est l'énergie, le moyen de démultiplier le pouvoir des hommes sur leur milieu... et sur leur prochain. Le mythe, tel qu'il est rapporté par Platon, affirme en effet que le feu provoqua l'*hubris* et de grandes guerres chez les hommes. D'où la polarisation du débat contemporain sur la technique entre ceux qui veulent laisser Prométhée agir librement, de manière à ce que les Hommes disposent de pouvoirs aussi grands que possible pour agir sur la nature, et ceux qui voudraient plutôt " ré enchaîner " Prométhée, jugeant que son pouvoir est devenu trop grand. Ce que l'on connaît moins est la suite du mythe : le désordre conduisit Zeus à envoyer Hermès pour remettre *Dikè*, la justice, entre leurs mains, qui permit de ramener la paix. Nous montrons que l'essentiel du mythe est dans cette seconde partie souvent oubliée, et non autour de la question de savoir s'il faut libérer ou enchaîner Prométhée. Cet article entend tirer parti des leçons de ce mythe pour analyser la géopolitique de l'énergie contemporaine. A la suite des analyses d'Ivan Illich, nous entendons montrer que la sobriété, ou juste mesure, par opposition à l'*hubris*, l'illimité, est l'une des conditions nécessaires de tout projet global ayant la paix pour objectif. Ce qui est mis en jeu avec le débat sur l'énergie n'est autre que la question de la répartition du pouvoir. Cela suppose de mettre en débat non seulement des questions de bien-être économique agrégé, mais aussi des questions de droit (droit au développement, droits des générations à venir etc.)

Index terms

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Editor's notes

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Full text

The lessons of Prometheus and Epimetheus

- 1 In terms of control, critics of technology often refer to readings of the ancient myth of Prometheus. What does this myth teach us (Plato)¹? He tells of how Epimetheus (literally meaning *afterthought*), the forgetful one, distributed gifts to all creatures, and because of this, had nothing left to give humankind. Prometheus, as his name suggests, was endowed with the gift of foresight; to make up for Epimetheus' omission and to give humankind a gift without which it would soon have perished, he stole fire and the arts, from Athena and Hephaestus. Consequently, he is punished for this theft and is put in chains. The usual interpretations suggest that Prometheus' chaining allowed for the domestication of the arts and of fire

and prevented Prometheus from endowing humankind with excessive powers that they would not have known how to control. Analyses often focus on these points, as if there were those who support the “re-chaining” of Prometheus on one side (Ministère de la Recherche: 2003), that is, giving the fire back to Hephaestus, stopping technical innovation and the risks it involves, and on the other, the supporters who, on the contrary, wish to see Prometheus remain unchained and count on the invisible hand or the materialism of history to harmonize everything and end up in a new era of abundance. In other words, the debate focuses on technical innovation to determine if the added power is good or not. Not surprisingly, it is around these same issues that discussions concerning the precautionary principle revolve (Kourilsky and Viney: 1999)

2 This, however, seems to present a truncated version of the myth. Indeed, when confrontations surrounding the precautionary principle are expressed in those terms, they usually end up creating a dialogue of the deaf. Technology and action in general always entail a certain risk; the problem being specifically addressed here is not that one (Arendt, 1961). The ending of the myth, too often forgotten, puts a different perspective on the issue. In fact, it is said that Zeus sent Hermes to bring justice (*dikè*) and respect (*aidôs*), that is, the ability to develop an argument with respect to what is just so that technology can follow and so that conflict, excess (*hubris*), may be contained. Justice and respect are not technologies in themselves, but they embody the capacity to discern, to debate and to collectively implement the ends to which technologies *must* converge. Mastering technology is therefore less a question of whether or not extra power should be acquired than it is a question of who will benefit from this power. Therefore, the myth does not claim that releasing Prometheus would undermine the gods or nature. Neither does it maintain that appeasing Prometheus will necessarily lead to a levelling of values, as Nietzsche may have thought (Nietzsche, 1871). Rather, it asserts that *hubris* undermines justice and respect, that is, that which should be given to others. It questions who will benefit from this power, and if it is legitimate, that it should benefit the people identified. There is nothing exceptional about this. We therefore see to what extent the ancient Greeks were not taken in by technology—that is, by power.

3 There are three lessons to learn from this myth. The first is that human beings can be so fascinated by the immediate power technology provides, that they can forget about the consequences of these actions. And this has never been truer than it is today: we have succeeded in modifying the planet to an unprecedented extent, but we have no control over the consequences of the use of this power. Humanity has certainly become a geological force (Vernadsky, 1926), but it is a force that is largely indiscriminate. This blind force is not solely the result of uncertainty about the action taken. For example, the hypothesis that climate change is a result of massive greenhouse gas emissions was put forward more than a century ago (Arrhénius, 1896). This blindness is also a result of humanity, or at least a small part of it, only being interested in certain aspects of the

world. For example, each year, the French newspaper *Le Monde* publishes a “state of the world” report, which is, in essence, devoted to the health of the economy and the technical innovations introduced by this economy. Surely the world represents much more than this! The state of less developed countries, the struggles for rights, the state of ecosystems and the planet, the current situation regarding equalities and inequalities and many other aspects are being ignored.

- 4 Industrialized societies are deeply involved in the race for *power*, but not for the *control* of this power. Improving conditions of well-being is no longer the criterion that guides most innovations, especially the most recent. Rather, it is the desire to *succeed in doing* what others *have not succeeded in doing*, or to see to it that a symbolic territory is taken from others, such as the “conquest” of space. The objective is to appear powerful and impress one’s adversary. Miracle workers succeed in dazzling the masses and leaders and making them lose all touch with reality. GMOs and genetics are excellent examples of this. Although these technologies are closer to risky tinkering than to control, they are nonetheless regularly touted by firms and researchers as having unlikely miraculous merit, such as the eradication of hunger in the world or the control of the human species. These shortcuts, which could not for one minute withstand serious analysis, are positively mind-boggling. And yet, these speeches are given without restriction in public spaces through the very significant concept of “*publicity*”—in other words, of reference discourse for common sense (Arendt, 1961). The fact that the debate revolves around the *potential* range of miracles rather than around the underlying issues of power proves that it works to a large extent. The promoters of these ideas and those who receive them both believe them, or in any case, prefer to believe in them rather than seriously reflect on the issues and concern themselves with bringing some truth, or at least debate, into the public arena.
- 5 The second lesson to remember is that power is not shared by all just because the select few who hold it *claim* to put it at the service of all, or *promise* that it will be done in the near future. Therefore, to claim that humanity will one day colonize space is to forget the basic laws of physics and the present state of natural resources, which indicate that this can ever only be true for an extremely small minority of the earth’s population, seeing that there might not be enough space in the biosphere for everyone to even have a moped. There are today 750 motorized vehicles for every 1000 people in the United States, compared to 8 in China and India (WRI, 2003) and these trends are also clearly incompatible with sustainable development (AIE, 2000). As it is well known, there is some danger involved in blindly delegating great power to a select few. This is as true in the field of technology as it is in other areas. This power can be used to subjugate others, in the present or in the future, human or not. The only way to ensure that control is maintained is to establish efficient structures that ensure participation and hold power in check. Controlling power involves nothing other than its democratization, to

prevent it from being personified, embodied, or seized by a few people. The absence of participation in collective decisions-making processes that determine the daily entitlements of individuals can be referred to precisely as *exclusion*, whether it is energy-related, digital or other. Exclusion leads to division and to confrontation. The problem is much more evident on a global level: while all international negotiations are taking place as if economic growth and development were possible for the entire planet, it is already impossible, ecologically speaking, to generalize what has commonly been understood as *development*, that is to say, the way of life of industrialized or “developed” countries. Telling developing countries that they will never consume like industrialized countries is telling them that they are being excluded from globalization. After 50 years of promises, this represents a grave injustice with far-reaching geopolitical consequences.

- 6 The third lesson is that, contrary to what is claimed by Hans Jonas (Jonas, 1979), the technological age is not only in need of ethics but also of justice, as the given problem cannot be solved on a personal level. Ethics specifically addresses individual behaviour, whereas justice concerns social order as a whole. Justice demands that what is due each person be respected, whether in the present, or the future, in the North or in the South. The traditional economic approach largely overlooks these issues. Its vision for the future does not extend beyond a decade, except for what comes in the guise of a promise of abundance, which it is not in a hurry to substantiate; and yet, signs of scarcity and the rise in inequalities—also being felt in industrialized countries—are on the increase. The trend the scenario is said to present (IPCC, 2001)—describing economic growth as continuing indefinitely into the future—has not been questioned thoroughly enough. How can this trend be possible? What are the real consequences? What exactly does this growth entail? There are numerous inadequacies in the GNP indicator, particularly over the long term; it therefore seems questionable to view growth as always being a desirable objective. However, from an ecological perspective, the evidence is clear; economic growth has, up until now, been accompanied by increased pressure on the environment. If certain pressures have stabilized or have decreased slightly, it has been either because of the imports of natural goods or the creation of new pressures (Rees and Wackernagel, 1999; Bringezu et Schutz, 2001). What has been acknowledged as the geopolitical North depends to a great extent on the use of resources and environment that could have been of use to the South and to future generations. This use goes beyond usufruct rights, as was recognized by Lock, for example: *“The same law of nature, that does by this means [that is, through work] give us property, does also bound that property too. God has given us all things richly. [...] As much as any one can make use of to any advantage of life before it spoils, so much he may by his labour fix a property in: whatever is beyond this, is more than his share, and belongs to others”* (Locke: 1690). These “others” might, for example, include future generations if not non-human organisms of the natural world. To use a

famous expression, consumption beyond a certain point *is theft* (Proudhon, 1840). This not only calls into question individual behaviour, but also the moral and natural environment of societies, and their mores and physical infrastructures (urban planning, transportation, etc.) as well, so that our behaviour is not completely unrestricted, but rather directly predetermined by them. Indeed, it is difficult to avoid using the car in remote suburbs or resist the consumer pressure created by the enormous amounts of money spent on “publicity” (which is included in the price of the product, rendering it all the more expensive). In France, close to 50 billion euros² are invested in different communication costs, all having the same objective: to encourage consumption. The moral and physical infrastructures of the production-consumption society condition us and restrict us, suppressing any real form of protest representing anything other than a minor adjustment. The precaution, in this case, can be related to the pursuit of the same goals, with some “precautions” being ignored sooner or later, because striving for the same goals eventually leads to the continued celebration of the same social passions, which the law, unless it makes use of a great repressive force, cannot suppress.

The solution through growth

- 7 *Hubris*, excess, the endless race towards power, was a danger well-known to the Greeks. For this reason, they made *arêtê* the tempering and balancing force, the supreme virtue of governance. The present system, however, runs contrary to this line of reasoning: instead of making temperance a central issue, it presents excess power and increased appropriation as a means to preventing truly political debates concerning the *distribution* of power from taking place. We are witnessing a generalized headlong flight. As long as average power increases over the short term and as long as growth brings more wealth, then everyone is happy and can expect more. Naturally, that is not altogether correct: power only increases *on average*. Even in “rich” countries, inequalities are on the increase. However, faith in growth is maintained, even among those who are excluded. An organization such as Attac, for example, does not call growth into question, only the distribution of its benefits. Coming back to Marx’s conclusions, it suggests that the problem is that wage earners, and to a larger extent, the excluded, are poorly paid for the effort they make for the common good compared to owners or other classes benefiting from either being born into a more privileged class or from rules working in their favour. Ultimately, everyone hopes to become richer in the future, and this hope keeps the debate within narrow boundaries.
- 8 This headlong flight is not only explained by the hope for increased well-being in the medium term in the context provided by the secularization of the world (Gauchet, 1985) or the rational principle of the perfectibility of the human species (Ferry, 1996). The definition of progress as unlimited growth cannot be part of a rational political plan. As

mentioned above, there is no reasoning that demonstrates that this objective is desirable over the long term. Nevertheless, the unlimited growth theory is presented as being a universal rationality, unaffected by the variability of cultures and opinions. It is presented as being an integral part of human nature, sheltered from historical contingencies, and as being a necessary and sufficient condition for progress. And when this does not occur, analysts are astonished. The following quote, taken from a United Nations report on global governance supports this: *"We must accept the notion that progress is not only the work of destiny, but also the fruit of our labour"* (Commission on Global Governance, 1995). Analyses from the WTO rest upon the same notions: the automatic convergence of all towards happiness, without the need for politics. This is also seen at an individual level, as was observed by Alain Gras in his analysis of the creation of leading-edge technologies (Gras, 1994). More recently, Michèle Descolonges, an organizational sociologist, also made the same observation in an interesting comparison between the wide use of the Internet and the electrification of Russia in the 1920s (Descolonges, 2002). Progress is seen as part of destiny, a sort of natural law, existing as long as growth is maintained. Humanity is merely fulfilling its purpose in life. Faith in providence is nowhere more evident than when "we" speak of "our" species. This vision is not based on rationality, but rather, on a philosophy of history, on a perception of humanity's destiny that is based on a completely artificial construct of the world. Hegel is still relevant today, as are also Rostow and Marx. The great narratives are not obsolete. The concept of naturalism is deeply felt: our perception of humanity's destiny is shaped by the idea of a natural law that decides for "us" and absolves "us" of having to express truly political thoughts. If the future is predetermined, why discuss it? Should we not first continue to acquire powers that "we" can master? Should not mastery come of its own accord with time, led by the invisible hand, or more generally, by progress—in short, by Providence?

- 9 This vision presents problems such as nuclear pollution, (waste, explosions, etc.) or climate change as temporary or involuntary phenomena. They are seen as nothing more than "accidents" occurring along the way, as temporary malfunctions that will eventually disappear (Virilio, 2002). Nothing is seen as being irreversible, since the powers of humanity, which are expected to grow at a constant pace, will rebuild everything in the future. It is assumed that the substitution of technical capital for natural capital is infinite³. There is therefore no need for concern. None of the problems encountered should call into question the fundamental directions taken by human action, which must continue to be guided by the same objectives and rituals: increased production and consumption, the constant modification of nature, etc. This belief helps explain the slow building of awareness to the threat posed by climate change. In 1959, although the climate change hypothesis had been proposed more than 80 years prior, Alain Michel continued to maintain vehemently, in the monthly magazine *Science & Vie*, that there was "no

reason to worry": instead, trust should be placed in the powers of science to find the temperature controls of the planet before environmental disaster occurs (Michel, 1959). Alfred Sauvy's assertion in 1973 that sea levels could potentially rise by 70 metres did not elicit a stronger reaction; there was no reinforcement of research programs, and greenhouse gas emissions went unquestioned. Likewise, when supporters of nuclear power promise to soon eliminate the dangers posed by nuclear waste, they do not have to provide any proof; on the contrary, it is up to those who assert that danger is involved to prove their case.

- 10 The unlimited growth theory is therefore not based on a carefully thought-out, scientific or rational plan, but rather, it is based on a concept of nature and particularly, on a concept of human nature. It is based on a set of beliefs concerning the ultimate nature of the world that cannot be proven but nevertheless are taken to be true. They suggest that humans are *homo faber* and that their environment is similar to a stationary inexhaustible warehouse of materials put at their disposal. The resources and the environments are inexhaustible; that is, they can either be replaced one after the other or they are indeed exhaustible. If humanity continues to follow the standards brought to the fore by the economy, nature will be "restored" and we will live in abundance until the end of time.

Taking on challenges or avoiding problems?

- 11 Orthodox theories concerning the development of energy use through the pursuit of economic growth alone rest on these assumptions laden with meaning. This was recently seen in France: every debate on energy presupposes that the protagonists pledge their allegiance to this scope of thought, which leads to the concealment of a certain number of issues.
- 12 First, this externalizes most of the difficulties associated with energy use, under the pretext that they will "some day" be internalized. And yet, "we" are not the ones who will find the solution to the problems posed by nuclear waste and climate change, but our children. "We" will not have to answer to the demands made by countries of the South to consume as we do when natural goods (Flipo, 2004b) become very scarce. By stating that "we" will find solutions "in the future," we are giving ourselves the right to transfer the problem over to future generations. These issues should generate discussions and maybe even be put to referenda. The Declaration of the Rights of Man and Citizen, a preamble to the Constitution of the Year I, stated that "*A people has always the right to review, to reform, and to alter its constitution. One generation cannot subject to its law the future generations.*" Discussing humanity as if it were one subject when it is actually a multiplicity of subjects is therefore very dangerous. Added to this is the fact that the uses of nature may

vary. Every culture maintains its own relationship with nature. It is not up to a given generation to make irreversible decisions concerning the nature of others. "We" are not future generations. Birth is the emergence of singularity, not only a continuation of self. Let us not take our desire for immortality as reality. Let us not fall into the trap so well known to psychoanalysts that has us wanting our children to be the continuation of our unfulfilled desires. We should remember the clear and simple lines of Khalil Gibran, which all of us have certainly encountered on our life's path: *"Your children are not your children / They are the sons and daughters of Life's longing for itself / They come through you but not from you / And though they are with you yet they belong not to you."* Nature belongs to us no more than our children do. It is a question of rights, not cost/benefits. To modify it irreversibly is to give ourselves the right to appropriate our children's future. This may be permissible, but only if we are certain that the modifications made are an improvement. And yet, nothing of the sort is taking place in either genetic engineering or with issues concerning climate change; in fact, quite the opposite is true.

- 13 Secondly, in the concept of nature as a warehouse, issues of scale and disruptions of natural regulation processes are never considered. Nature is always seen in Newtonian terms: linear and reversible. However, from an ecological perspective this is understood to be false: indeed, nature is a complex and fragile network of regulations, made up of distinctive areas each having their own characteristics and laws. Consumption does not come out of nowhere: we create neither matter nor energy. We are simply modifying a dynamic and changing nature. Waste stays in the environment and takes on a life of its own. Although waste is seen, by the orthodox frame of thought, as confined to the area in which it was deposited, it nevertheless changes and has certain impacts. If it is biodegradable, then it does not pose a problem: it is reintegrated into the natural cycles of the environment of its own accord. If not, it disrupts natural regulatory functions, the results of which have been climate change, thinning of the ozone layer, etc. In a natural environment, certain changes are irreversible, that is, either definitively or for a very long period of time; these include death, climate changes, loss of biological diversity, areas contaminated by heavy metals or radionuclides, which have a lifespan of more than a million years, etc. This warehouse of materials presupposes that a set of regulations, human or not, is maintained: market conditions, standardized practices, stability of materials, etc. However, these regulations might not be maintained in the future. Indeed, there are numerous signs pointing in that direction. Political stability is not guaranteed, and we have begun to seriously affect the ecological balance. Petroleum, for example, currently plays an essential role in social regulations; however, there is every indication that the point at which it will become scarce is "approaching,"⁴ at least when considering the speed at which infrastructures are changing. How is it possible to survive in a city such as Los Angeles without energy for automobiles? Does avoiding chaos in Los Angeles not justify going to war to obtain the energy required to

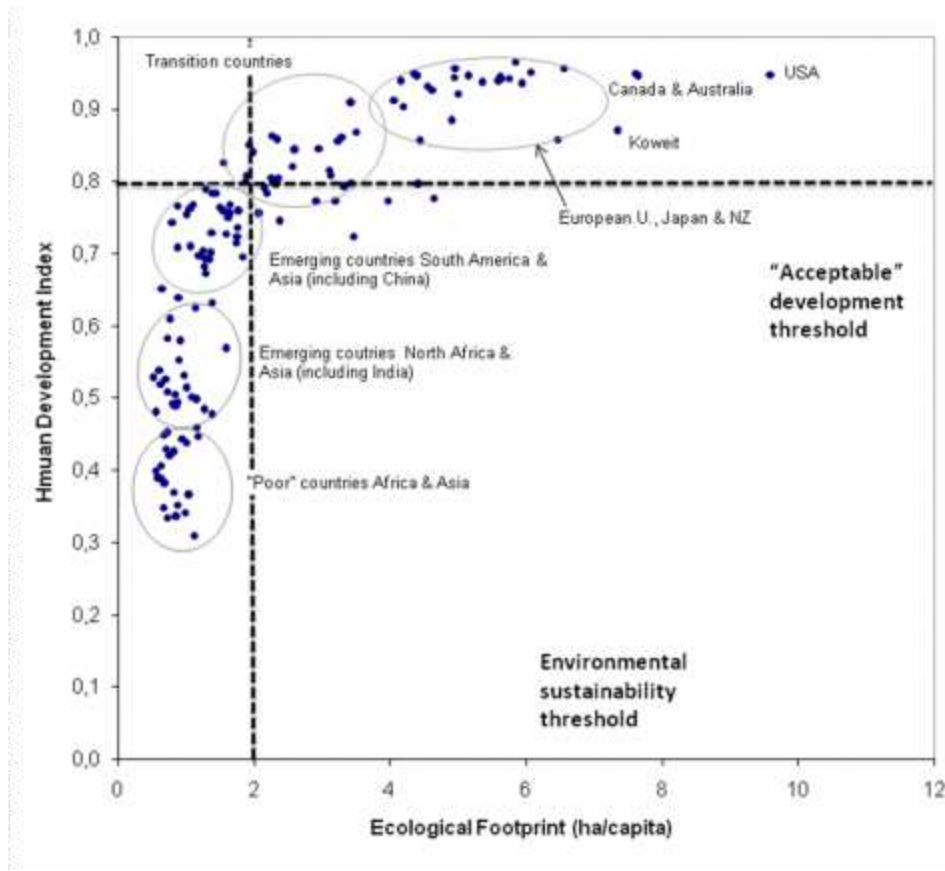
maintain the regulations that have been established for this purpose? The disruption of regulations creates an insecurity that first affects the most vulnerable and those who cannot pay for the services of a contrived protection.

14 Thirdly, inherent to the warehouse concept is the assumption that no natural assets have any intrinsic value: any worth can only come from human labour. Human-created processes are vehicles for the reorganization of the world according to "economic rationality." And yet, nature provides many assets: recycling of waste, soil regeneration, species turnover, etc. These assets have always been acknowledged everywhere up until the industrial era: usufruct became land annuity in the nineteenth century and slowly became reduced to nothing. Today, efforts are being made to assess, in economic terms, the contribution of nature to global well-being (Costanza, 1997); and yet, it is clear that this aspect has been neglected and is still neglected today to a very large extent. Moreover, economic instruments developed to tally goods that are exchangeable on the market come to clearly unsatisfactory results. Natural regulations also provide a security that human-made regulations cannot provide. Humans can fail, betray, and behave as if they were stowaways. When contracts are no longer honoured, when payments can no longer be made, people reorganize themselves at lower levels of governance: this was clearly seen during Argentina's crisis and the collapse of the USSR. When people no longer have access to collectively produced goods, they have no other choice than to rely on local or even only personal goods. The protection of these natural assets, which are free and available everywhere, therefore provides a minimum guarantee of freedom. Of course, these assets are not equally distributed: land is not equally fertile everywhere. The biosphere is not Eden. Nevertheless, they are the primary source of wealth for human beings, particularly those considered to be poor in economic terms, that is, those who do not have any source of income. Forests have always catered to all the activists of the world. They are areas that elude social normalization and therefore the control of societies, even if they are totalitarian (Roux, 1999). Natural assets do not require a dependable political organization to be maintained, for nature takes care of that. They are often more sustainable than human-made assets and they are free. And yet, today, these regulations are threatened, even already deteriorated and damaged.

15 Fourthly, the dominant theory advances that all countries will converge towards the same "standard of living," that is, towards the social organization existing in industrialized countries today. And yet, we are not able to generalize our use of energy without causing damage that is far greater than the benefits obtained. The majority of the world's population uses very little energy, and what it does use is obtained mainly from biomass. Exported as raw materials, fossil fuels are becoming depleted and that at a price that does not reflect concern over distribution, for they are practically being sold at the price they were worth when extracted. Populations living by the extraction sites rarely benefit from this

commerce. Companies involved in this business rarely pay any heed to the dictators that must be appeased to retain property rights, which is why the Ogoni have launched a battle against Shell in the Niger Delta. Most of the natural assets used today as resource or environment (waste) are low-entropy sources having the characteristics of finite stock (Georgescu-Roegen, 1979): their consumption is irreversible. Mines cannot produce more than the fossil deposits will allow. Only sustainable flows can regenerate. In addition, there is the iron law of diminishing returns: beyond a certain point, the energy expended to exploit the resource exceeds the energy produced by the resource. What resources will the world's poor use? The material consumption data are very clear: using growth as a solution for the social discord of the North and the transnational elite will erode future opportunities for generations to come and reduce the chances of the South seeing its living conditions improve. A miracle solution will not be available every time an internal distribution conflict in Europe must be resolved. Overload leads to congestion and congestion destabilizes the organization of the system as a whole. This is true for greenhouse gases as much as it is for automobile traffic. Avoiding the destabilization of systems entails regulation of access. The increase in power of some cannot be achieved without the decrease in power of others. The freedom of some must feed off the freedom of others. The global ecological space (Flipo, 2002) is no more infinite than is the space on a highway: choices must be made, and the choices being made at present are laden with consequences. Some fear the creation of a global apartheid or an ecological neo-colonialism (Agarwal et al., 1999), in which an industrialized minority continues to use resources by preventing the rest of the world from consuming and in so doing, avoids having to call into question its way of life. Considering that the poor being referred to already have the atomic bomb (India, China), the future seems less radiant than the proponents of a conflict-free globalization would like to believe.

Figure 1. Comparison of environmental performance in 49 nations.



Source: Boutaud, (2003).

- 16 In the end, the problem is not so much to liberate or chain Prometheus as it is to stop believing in the myth of humanity as *homo faber* with its warehouse of materials affirming a predetermined future that will be glorious for all. This myth prevents us from seeing the real issues. Growth does not automatically lead to progress for everyone and the reasons for this have been known for a long time. As shown by Ivan Illich (Illich, 1973), they concern the materiality of the human condition, which is reaffirmed today in the ecological world view. The development that is taking place can only benefit a minority of the world's population; it is therefore urgent to rethink the energy issue in this context, rather than by sector or in a reductionist manner.

Conclusion: the path of moderation and the justice challenge

- 17 Energy is the fire that brings machines to life. Without it, there would be no armies of mechanical slaves or non-unionized workers working relentlessly, day after day, without complaining. There would remain only

physical power and energy derived from the sun, wind, biomass, etc. There is no energy source that is clean, free or unlimited. They all give rise to some disadvantages that may be more or less serious or irreversible. Knowing who will be subjected to these disadvantages is as important as knowing who will benefit from the advantages, or if these advantages will increase at a given point in time. Machines are not necessarily useful: although they can reduce fatigue and suffering, they can also increase the production of weapons, become the source of destruction or be used to serve the interests of only a few. The real issue is to rethink the common good. It is clear that economic growth alone is leading us down the path to ruin. The trends described by trend scenarios are clear and support one another (WEC, 2000; UNPD, 2000). Unless various technological miracles are expected to occur—which, once again will be the responsibility of future generations—the world is headed for serious crises.

18 The issue is not the standard of living or comfort levels: numerous scenarios have shown that it is technically possible to attain a comfortable standard of living without compromising the well-being of others⁵. Places such as Sri Lanka or Kerala, in India, have attained very high levels of well-being while having a very minimal impact on the environment (cf. Figure 1). Mechanization no longer frees humanity from work. The effort expended today is for the most part devoted to the production of disposable objects or the creation of extra needs. This, in fact, has been the justification for putting human beings to work. We no longer have time for anything; everything moves too fast; we never stop running from one job to the next, never stop producing, consuming, filling out papers, etc. Other cultures have generally worked much less than ours, considering that their economic needs were met, as was shown by anthropologist Marshall Sahlins (Sahlins, 1976). Truly, the issue lies elsewhere. We must explore new avenues of cooperation founded on sharing and the recognition of others and not on exploitation and consumption. This leads to the questioning of the meaning of life for individuals and for communities: do we really need everything that we consume? Are we prepared to pay the price for our unrestrained over-consumption: police state, global apartheid, conflicts, ecological imbalances, etc.? Or do we want another world for ourselves? If that is the case, the creation of this other world starts with individuals: we must initiate the changes we would like to see take place in the world. Reducing our consumption means working less; it means taking part in the creation of a world that is more just and more united. As Gandhi once said, "*There is enough on this earth to meet everyone's need but not everyone's greed.*"

19 The issue of needs must therefore be brought up once again, before the appetite of a few ends up devouring everyone else. This particularly involves raising questions about human nature. Yes, we must speak out forcefully against Bush and his consorts; justice requires that we assert that "*our way of life is negotiable*". This must be done to prevent globalization from turning into a bloodbath. *Homo economicus*, who has an insatiable appetite, is a fiction who has become dangerous. Progress no

longer entails producing and consuming; it involves building sustainable societies that live in harmony with their natural environment. The means necessary to achieve this are stated in the triptych "*moderation, energy efficiency and renewable energy*"⁶ and are at the service of justice. This is not a question of GDP points, but rather, an issue concerning civilization.

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http://www.wbcsdmobility.org/dialogues/files/pf_presentation.pdf

Notes

1 Plato's version is referred to here.

2 For the years 1999-2000. See the advertisers' website : <http://www.aacc.fr>

3 Which, for example, leads to a hypothesis of infinite substitutability of human-made services for natural services – cf. R. Solow, 1992 cited in IPCC's, *Second Assessment Report*, 1995, p. 139.

4 Hubbert Peak, <http://www.hubbertpeak.com>

5 Example of Négawatt scenarios in France: <http://www.negawatt.org> or of scenarios from the Mission Interministérielle sur l'Effet de Serre (France) for low-carbon societies: www.effet-de-serre.gouv.fr

6 As stated in the " Manifeste négaWatt pour un avenir énergétique sobre, efficace et renouvelable." www.negawatt.org

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