Pan-European democracy, social justice and environmental sustainability
For a just, sustainable and happy society

The global challenges of the 21st century

We unite the people that work and act together - that **cooperate** - in a **democratic** way, at the scale of the **European Union**, towards making our vision of a **just, sustainable and happy society** for the 21st century, the **Society of Agreement**, a reality.

The Society of Agreement is the positive alternative to the global collapse that the current global trends, which we call the global challenges of the 21st century, lead us to if nothing is done.

What are these challenges? Why should a cooperative approach solve them? Each of these questions is answered in greater detail below.

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1 Executive Summary

We identify six global trends of the 21st century: (1) **climate change**, and more generally the consumption of resources beyond the regenerating capacities of our environment, (2) **demographics** and the explosion in the number of elderly and chronically-ill people, (3) the social **inequalities** brought by digital technologies, (4) the **concentration of power** in the hands of **multi-national corporations**, (5) the rise in **poverty** and **precariousness** for large fractions of the population, and, as a consequence of the above, (6) a rising wave of **mass migrations** and of **xenophobic nationalism**.

Confronted with these global trends, feeling grows that the world is governed by a global, selfish oligarchy, doing nothing to prevent a **global collapse** made of ecological disaster, social chaos, political fragmentation and nationalistic wars.

Solving these problems requires **cooperative agreements** on sharing fairly the costs, benefits and risks of the adaptations that they require from our societies, within the very short time frame given left to us by the physical and biological laws governing climate change and resource depletion. This is a daunting task. We create CosmoPolitical Cooperative to enable these agreements, on time.

2 The "Western" life-style exerts an unsustainable pressure on the climate and on the natural environment that support human civilisation

Humankind depends on natural resources for its livelihood, for its basic, biological life, and for all elements of a human civilisation, in the strong meanings of “human” and of “civilisation”.

All humans need **food** to sustain their biological life. Food is produced by agriculture, in volumes that depend upon available arable surface, and upon yields, i.e. the production per unit of surface.

Arable surface is depleted by erosion[1], by urban sprawl, by desertification, and by the rise in sea levels brought by global warming[2], that flood the rich agricultural delta regions where the population concentrates (Bangladesh, the Netherlands, Vietnam, the Nile delta in Egypt…). The only recent gains in arable land were essentially obtained to the detriment of primary tropical forests, specifically in Brazil and Indonesia, to grow soybean and oil palm trees, respectively.

The arable land available for human food is additionally constrained by the competition for the use of arable surface between (1) direct food for humans (e.g. cereals, legumes, fruits, vegetables),

1 Food & Agriculture Organisation (FAO): "Status of the World's Soil Resources. Main report", 2015, downloadable at: http://www.fao.org/3/a-i5199e.pdf, of which the main findings are accessible at: http://www.fao.org/news/story/en/item/357059/icode/

2 Wong, P.P.et. al.: "Chapter 5: Coastal systems and low-lying areas." In: "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects", Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 361-409 Downloadable at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap5_FINAL.pdf

(2) animal feed (e.g. soya)[3], which feeds the animals (e.g. cows, chicken, pigs) whose products will be eaten by humans (with a significant transformation loss – specifically in the case of beef), (3) fibre used in textile and clothing (e.g. cotton, wool), and (4) fuel (e.g. wood, liquid agro-fuels used in internal combustion engines).

In addition to these losses in arable surface, **agricultural yields** are anticipated to **deteriorate** badly if the global warming continues[4], despite massive investment in agricultural bio-technology, and massive input of non-renewable fertilisers (based on the extraction of potassium and of phosphates, and on the combustion of natural gas to capture the nitrogen of the atmosphere). As a striking illustration, in a “business as usual” scenario (where global warming reaches 3.5°C), a recent study anticipates **heat waves** in **France**, one of the agricultural breadbaskets of Europe to reach ca. **55°C**, i.e. a temperature close to the current heat records of the world-known Death Valley in Southern California (United States of America), over several weeks. Under such extreme temperature conditions, it is doubtful that any of the plants and trees currently present in France will survive, not to mention agricultural crops.

A further reason for agricultural yields to deteriorate is because soils lose organic nutrients and biodiversity[5].

If nothing is done, f**ood available for human consumption** will thus **decrease** over the next decades, frontally colliding with the increasing needs of a growing population (see below) and of a growing per capita consumption, due to an evolution towards meat- and dairy-based diets.

This threat on our future food supply is only the most visible illustration of the fact our current industrial civilisation consumes more renewable natural resources than what the Earth can sustainably regenerate. To be more accurate, our current consumption levels are above 3 of the 9 "planetary boundaries" that ensure the stability of Earth as a set of bio-physical systems: climate change, biodiversity loss and nitrogen depletion[6]. Said differently, **we "use" 1.6 planets**[7], and only have one available – now and in any realistically foreseeable future.

In addition to this over-consumption of renewable natural resources, humankind also uses vast quantities of materials and energy to provide all the amenities of material life: construction materials (e.g. limestone for cement, gravel for concrete) to build homes and transport infrastructure, metals, glass and plastics to produce the full range of industrial products that we are surrounded with as consumers and as users of technical infrastructure (water, sewage, electricity, telecommunications, hospitals) – and energy to produce and operate them all. Only a small fraction

3 Manceron, S. et al. "Feeding proteins to livestock: Global land use and food vs. feed competition". OCL 2014, 21 (4) D408, downloadable at: https://www.ocl-journal.org/fr/articles/ocl/abs/2014/04/ocl140020/ocl140020.html

4 Porter, J.R. et. al. "Food security and food production systems". In: "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)", Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014, pp. 485-533. Downloadable at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap7_FINAL.pdf Scientific research converges towards a deterioration of yields after 2030, with worse deterioration in developing countries (see Figure 7-5).

5 Food & Agriculture Organisation (FAO): "Status of the World's Soil Resources. Main report", 2015

6 Rockström, Johan et al. "A safe operating space for humanity", Nature 461, 472-475, 2009, accessible at: http://www.nature.com/nature/journal/v461/n7263/full/461472a.html

7 Based on the "Ecological footprint" concept, available at: http://www.footprintnetwork.org/our-work/ecological-footprint/

thereof comes from recycled sources of materials[8], or from renewable energy sources[9].

The fundamental reason for this **unsustainable** situation is the **"Western" lifestyle and consumption pattern**, based on individual suburban housing, automobile-based mobility, air travel and meat consumption. It is also due to our current extract – produce – consume – throw away industrial model, also known as the "linear" or "cradle to grave" model, where the external costs of using non-renewable resources is ignored – and quietly passed on to future generations that will find the mines empty – and the landfills full of our waste.

The **unsustainable** nature of our societies is even more apparent when we realise that this happens at a time when only a **minority** of 1 billion humans (essentially in Europe, North America, Australia and Japan) reach these excessive consumption levels[10]. They can in no way be generalised to the remaining 6 billion humans that aspire to be part of the new global middle class, and to reach the benchmark of the "Western" lifestyle against which, in the absence of any desirable alternative, they evaluate their wealth, well-being and social achievement.

Our production and consumption patterns are not sustainable, resources are finite, and global warming is caused by humans. All this we know. We must be aware however that these are not theoretical, abstract, long-term considerations. All civilisations **collapse**[11] when they exert a pressure on their available natural resources beyond what these natural resources can regenerate. Our industrial civilisation is no exception, despite the immense and unprecedented resources that we mobilise. Civilisational collapse is the most terrifying prospect possible: the Rwanda genocide of 1994, or the civil war in Syria since 2011, only give a pale image of what a global civilisational collapse would look like. When the biological survival is at stake, for lack of food, any violence becomes legitimate, and war, whether civil war or foreign war, becomes a merciless, total exercise of mass destruction. No form of humanity, nor of civilisation, survive. The current "terrorist" developments in areas plagued by persistent and recent drought related to climate change, such as North-East Syria and Northern Iraq, or the region around Lake Chad, respectively home to Daesh (aka "Islamic State") and to Boko Haram, testify the close relationship between man-made poverty and extreme, nihilistic, violence[12]. Preserving our environment is thus synonymous, in the long term, to preserving the biological and physical substrate of human civilisation.

There is only one way to prevent this dreadful scenario of civilisational collapse from becoming

8 Recycled content for metals varies between 1% for lithium (used in batteries) or Erbium (used in the laser amplifiers of optical fibre telecommunication networks) and 40% for iron: United Nations Environment Programme (UNEP), "Recycling Rates of Metals. A Status Report", 2011, downloadable at: http://wedocs.unep.org/bitstream/handle/20.500.11822/8702/-Recycling rates of metals: A status report-2011Recycling_Rates.pdf?sequence=3&isAllowed=y

9 The global share of renewable energy (hydroelectric power, wind turbines, solar photovoltaic and thermal panels, geothermal) in the total energy mix – not only that of electric production – is 13.2%. Source: International Energy Agency: https://www.iea.org/about/faqs/renewableenergy/

10 e.g. United States: 8.6 global ha/person, to be compared to the figure for Mali: 1.3 global ha / person and the world average: 2.87 global ha / person (2013), cf. http://data.footprintnetwork.org/countryTrends.html?cn=5001&type=cdPC

11 Diamond, Jared. "Collapse: How Societies Choose to Fail or Succeed", Viking Press, New York, 2005, with a summary available at: http://www.jareddiamond.org/Jared_Diamond/Collapse.html

12 Nett, Katharina and Lukas Rüttinger: "Insurgency, Terrorism and Organised Crime in a Warming Climate. Analysing the Links Between Climate Change and Non-State Armed Groups". Adelphi, Berlin, 2016 https://www.adelphi.de/en/publication/insurgency-terrorism-and-organised-crime-warming-climate

reality: to **change our production and consumption patterns**, so as to align our consumption of resources with what natural phenomena can sustainably regenerate – as those civilisations that escaped collapse in past human history testify[13]. This is the very purpose of the COP 21 Paris agreement on climate of 2015, and of commitments to achieve **net-zero emissions by 2050**, and of all efforts to engage towards a Circular Economy[14].

This is a massive change. It will require both enormous **investment** (in transport networks and systems, in urban planning, in the thermal insulation of buildings, in electricity production facilities, in the design of long-lasting products and of maintenance services, in "Circular Economy" business models), beyond the means of most countries and continents, and **revolutions in life-styles** (towards frugality, and away from the most wasteful features of the "Western" model), even for the poorer members of industrialised nations. The scale of the investment needs (estimated at USD 6,000 bn / year for infrastructure alone[15]) means that massive **international transfers** will be required, way beyond the current (unfulfilled) pledge of a USD 100 bn. / year grant for climate change mitigation and adaptation foreseen in the COP 21 Paris agreement[16]. It also means that the global financial system will need to be strongly oriented towards these investments, rather than towards ever-increasing liquidity and volatility. The depth of **renouncement** to be made in terms of life-style (and in terms of aspiration to it), e.g. bearing on air travel, on automotive mobility and on diets based on animal products, demands that they be **shared fairly** between nations, social classes and generations – with no way for parts of the population to free-ride on the efforts made by others. In these matters, any injustice will be paid by conflicts and by loss of time in the transition.

Considering the pace at which climate deteriorates, and at which natural resources are being depleted, the change will need to be fast, within a few decades – much faster than most civilisational revolutions of the past (which typically extended across a few generations). The clock is ticking, and there is no way to negotiate delays with laws of physics or of biology.

As a conclusion, the fast and thorough **transition** of our civilisation towards **environmental sustainability** will induce massive costs, benefits and risks. **Sharing** these costs, benefits and risks **fairly**, at a global scale and between generations, is the only way for these changes to happen, and to happen on time.

13 Examples of which are given in Diamond, Jared. "Collapse: How Societies Choose to Fail or Succeed", Viking Press, New York, 2005, chapter 9: the Melanesian island of Tikopia – which renounced breeding pigs at the end of the 18th century, despite them being the ultimate display of power and wealth in their society –, Japan under the rule of the Tokugawa shoguns – who managed their forests with utmost administrative detail to prevent disastrous deforestation, soil erosion and floods on a rainy island with steep, forested slopes.

14 "In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value." in European Commission, "Closing the loop - An EU action plan for the Circular Economy", 2015, downloadable at: http://ec.europa.eu/priorities/jobs-growth-investment/circular-economy/docs/communication-action-plan-for-circular-economy_en.pdf

15 New Climate Economy: "The sustainable infrastructure imperative", 2016, downloadable at: http://newclimateeconomy.report/2016/wp-content/uploads/sites/4/2014/08/NCE_2016Report.pdf

16 cf. http://unfccc.int/cooperation_and_support/financial_mechanism/items/2807.php

3 The population of elderly and chronically-ill people needing care will explode throughout the 21st century

Life expectancy at birth of humans has **increased** remarkably over the last centuries, first in Europe (e.g. in France, from 25 years in 1750 to more than 80 years in 2016[17]), then globally (from an average of 46 years in 1950-1955[18] to 70.5 years in 2010-2015[19]). This is good news: longer life expectancies at birth is the translation into a single statistical indicator that health care and life conditions improve over the whole life-span of the population.

Simultaneously, a **demographic transition** took place, with **fertility rates falling** globally, from a world average of 5.02 in 1960-1965 to 2.51 in 2010-2015[20]. The fertility rate of 2.1 that renews generations and stabilises the population has been reached in 2017 by all continents except Africa. The main issue for the future is the date at which this stabilising fertility rate is reached by Africa: if it is reached early (2050), then the number of humans on Earth will peak around 9 billion in 2050 (among which 2 billion in Africa), before it decreases[21], if it is reached late (2070), then the number of humans on Earth would stabilise after 2100 only, and above 11.2 billions[22] (among which 4.4 billion in Africa).

At the same time, the proportion of **older members** of the population will **increase**. People over 70 years of age are financially supported by those able to work (be it through formal pension systems, or via informal family solidarity), and increasingly require (health and life support) care services as they get older. This population requiring financial support and care services will represent 1.130 bn. people (i.e. 11.4% of the world population) in 2050 and 1.650 bn. people (i.e. 15.2% of the world population) in 2080, compared to 400 M (i.e. 5.3% of the world population) in 2015, a four-fold increase in absolute numbers and a three-fold increase in relative proportion in the 65 years between 2015 and 2080[23]. This means that the number of people in activity (aged 20 to 69) having to support one elderly person deserving care (above 70 years of age), aka the "support ratio", will be reduced from 11.5 in 2015 to 4.8 in 2050 and 4 in 2080 globally, and from

17 INED (French national demographics institute), 2017: http://www.ined.fr/fr/tout-savoir-population/graphiques-cartes/graphiques-interpretes/esperance-vie-france/

18 United Nations, Department of Economic and Social Affairs, Population Division (2004), "World Population to 2300", Table A.4, p.185), downloadable at: http://www.un.org/en/development/desa/population/publications/pdf/trends/WorldPop2300final.pdf

19 United Nations, Department of Economic and Social Affairs, Population Division (2015). "World Population Prospects: The 2015 Revision, Key Findings and Advance Tables". ESA/P/WP.241, table S.12 p.45), downloadable at: https://esa.un.org/unpd/wpp/Publications/Files/Key_Findings_WPP_2015.pdf

20 United Nations, Department of Economic and Social Affairs, Population Division (2015). "World Population Prospects: The 2015 Revision, DVD Edition", downloadable at: https://esa.un.org/unpd/wpp/DVD/Files/1_Indicators%20(Standard)/EXCEL_FILES/2_Fertility/WPP2015_FERT_F04_TOTAL_FERTILITY.XLS

21 United Nations, Department of Economic and Social Affairs, Population Division (2004), "World Population to 2300"

22 United Nations, Department of Economic and Social Affairs, Population Division (2015). "World Population Prospects: The 2015 Revision - Special Aggregates, DVD Edition", downloadable at: https://esa.un.org/unpd/wpp/DVD/Files/2_Indicators%20(Probabilistic%20Projections)/UN_PPP2015_Output_PopTot.xls

23 United Nations, Department of Economic and Social Affairs, Population Division (2015). "World Population Prospects: The 2015 Revision - Special Aggregates, DVD Edition", downloadable at: https://esa.un.org/unpd/wpp/DVD/Files/3_Indicators%20(Special%20Aggregates)/EXCEL_FILES/4_Ecological/Population/WPP2015_SA4_POP_F09_1_PERCENTAGE_OF_TOTAL_POPULATION_BY_BROAD_AGE_GROUP_BOTH_SEXES.XLSX

5.4 in 2015, to 2.7 in 2050 and 2.5 in 2080 in Europe[24].

This challenge is compound by the fact that the "Western" life-style is not sustainable either at the individual level. The attached sedentariness and over-consumption of energy- and fat-intensive food lead to a range of lifestyle-related (and thus fully avoidable) **chronic diseases** (i.e. which cannot be cured, and for which the only hope is to delay deterioration): obesity, diabetes, hypertension, colon and breast cancers. These diseases have become the first cause of deaths globally, even in developing countries, above the traditional plagues of infectious diseases: they kill 40 million people each year, equivalent to 70% of all deaths globally[25]. Before causing death, lifestyle-related diseases produce avoidable handicaps, at massive scale, transforming productive workers into people needing external support – and increasing further the burden to the care and pension systems.

Traditional societies also had a large proportion of people deserving care and support (specifically: education): the children and teenagers. Children and teenagers increase their autonomy and capabilities over time, and can be expected to provide a form of "return on investment" by becoming productive in the future (either at the small scale of the family or at that of the whole social protection system). Education efforts can be considered as investments, and even as highly profitable ones, specifically for infant care and early education[26].

The current, and future, situation will be anthropologically different. The situation of elderly and of chronically ill people can only get worse, and providing more or better care does not improve the economic prospects of those providing it: it is a pure cost. The traditional respect and gratitude towards the elderly was self-evident when they were the very few that had survived, and that had experience. It is less so when they are many, and drawing substantial resources (directly or in the form of pension contributions) from those that produce them, and when the older generations cumulate wealth and leisure with security of income and of shelter, while the younger remain stuck in poverty, precariousness and over-work.

Conflicts between generations on how to share the **costs of care**, and between allocating resources to the education of the young or to the care for the elderly, within countries and regions, and between countries in the same region, and between regions with young (such as Africa) or old populations (such as the European Union), are thus bound to surge, alongside the fraction of the elderly and of the chronically ill in the population.

24 United Nations, Department of Economic and Social Affairs, Population Division (2015). Graphs accessible at: https://esa.un.org/unpd/wpp/Graphs/Probabilistic/PSR/20-69/70plus/

25 World Health Organisation, Noncommunicable diseases Fact sheet (Updated April 2017), accessible at: http://www.who.int/mediacentre/factsheets/fs355/en/

26 Cleveland, G.; Krashinsky, M.: "The Benefits and Costs of Good Child Care: The Economic Rationale for Public Investment in Young Children. A Policy Study. Monograph No. 1", Toronto Univ. (Ontario). Centre for Urban and Community Studies, 1998, downloadable at: http://files.eric.ed.gov/fulltext/ED435452.pdf
Cleveland, G.; Krashinsky, M.: "Investing in Early Childhood Education and Care: The Economic Case", International Encyclopedia of Education (Third Edition), 2010, Pages 63–68, available at: http://www.sciencedirect.com/science/article/pii/B9780080448947011714

4 Digital and other fixed-cost integrated systems create fantastic improvements in technical efficiency, but generate massive social inequalities

Once they are set up, technical and institutional **systems** and **infrastructure** (e.g. transport, energy or telecommunication networks, software platforms, standards, regulations) are remarkably **efficient** in their use of resources (raw materials, energy, human work). They epitomise the benefits of **productive investment**. Resources are **spent once** (to develop the product or software, to agree on the regulation, to build the infrastructure), the equipment or institution is installed and commissioned, and it delivers its **benefits** to society **indefinitely**, at very low additional cost in resources – provided of course that it is properly maintained.

This situation is known in industrial economics as that of "**fixed-cost**" (or "zero marginal cost) economics. Our technical and institutional systems evolve in this direction, in a process of **accumulation of** (technical, intellectual, institutional) **capital**. In one sense, this is good news. The existence of this accumulated capital, and the technical efficiency that it brings (together with vast quantities of available energy) to human work, is what differentiates industrial societies from their predecessors. These highly efficient systems are able to provide remarkably complex and reliable product-service bundles, with a very efficient usage of those resources that have an economic cost, to the short-term benefit of all consumers. Whether some resources are used without being paid for (e.g. environmental resources), whether the quality and reliability of products are subordinated to the immediate turnover of "throw away" business models, and whether the quantity and economic value of products being delivered to customers is a measure of their satisfaction, is another debate.

The bad news however, is that fixed-cost economics, in which value is produced by integrated technical and institutional systems, **puts our economic and social distribution system upside down**. Classical economics is based on the model of agriculture, where the most fertile land is cultivated first, and the least fertile last, with the assumption that an infinite reserve of even less fertile land is always available. Thereby, each additional unit being produced costs more resources (in human work and others), because it is grown on less fertile land. This situation is known as that of "increasing marginal costs" in economics. Additionally, in this model, production can be easily attached to the work performed: on each square metre of land, the harvest is related to the number of hours worked by the farmer on that square metre. That work is independent from the work performed by other farmers, and of the work performed by that farmer elsewhere on his/her farm. Therefore, the productivity of the work performed on that square metre can be computed easily: it is the harvest divided by the time worked. Under these circumstances, the market mechanism leads to a form of optimum, and determines the price of goods (equal to the cost of the last, least efficiently produced, unit, i.e. the "marginal" unit) and the salary of work (equal to the productivity of the last, least efficient, "marginal" hour of work). This system has been at the root of the social distribution model of the early industrial age, where unit costs remained high enough for the approximation to hold.

None of these assumptions remain valid in the contemporary capital-intensive industrial world of fixed costs and of integrated systems. In this world, (1) marginal costs decrease, instead of increasing, because the fixed cost is divided among a larger number of users; (2) the productivity of work cannot be computed, because the system is not finished until the last element is added to it, so that the value of each element of work can both be considered as being zero (because it is not sufficient to make the system work), and equal to the value of the whole system (because it is also absolutely necessary for the whole system to work – as was epitomised with the small O-shaped ring which caused the space shuttle "Challenger" to blow up upon take off in 1986[27]) – with no means to solve the contradiction. This means that **neither prices, nor salary levels, can be defined by standard market mechanisms**.

Fixed-costs economics also lead to **concentration of power and wealth**, because the largest player on any market has a cost advantage over its competitors, so that the situation evolves naturally towards a **monopoly**.

These evolutions, which were present since the first Industrial Revolution, have accelerated dramatically with the **digitalisation** of economy and of productive systems. Software is the ultimate fixed-cost good (producing one additional copy costs zero), and the ultimate integrated system (it does not work until the last line of code is written). The owners of digital monopolies (software companies such as Microsoft, telecommunications operators such as America Móvil, on-line platforms such as Google, Facebook, Apple or Amazon) become obscenely rich[28], while workers are reduced to a global precariat, lured into obedience by the hope of winning in the lottery economics of "app" development.

Digital technologies, in addition of being vectors of concentration of wealth and power, are also, like all previous drivers of industrial revolutions, a factor of enormous **labour productivity gains**. Digital technologies (robotics, artificial intelligence) perform tasks (including intellectual tasks) much better than humans, and will increasingly be doing so in the future. Even management consulting firms predict that an enormous **45% of human tasks could be performed by existing, demonstrated digital technologies**[29]. If even institutions with such close corporate relationships as business consultancies make gloomy predictions, when their political interest would rather be to hold an assuaging discourse, then reality is probably even worse.

In previous industrial revolutions, the improvement in productivity has systematically been compensated, and above, by increases in production volumes. Instead of producing equal quantities with less hours being worked, the tendency has been to produce more by keeping the number of hours worked constant – thereby creating an addiction to growth of our productive systems. With this digital industrial revolution (the 3rd or 4th, according to interpretations), this flight forward becomes impossible, not because of the digital technologies themselves, but because any

27 NASA - "Report of the Presidential Commission on the Space Shuttle Challenger Accident", 1986, accessible at: https://history.nasa.gov/rogersrep/genindex.htm, Chapter V: The Contributing Cause of The Accident"

28 With fortunes ranging in the tens of billions of USD each, cf. Forbes list of billionaires: https://www.forbes.com/billionaires/list//

29 Chui M. et al. "Where machines could replace humans—and where they can't (yet)", McKinsey Quarterly 2016 n°3, pp.58-69, downloadable at: http://www.mckinsey.com/quarterly/digital-newsstand/2016-issue-3-mckinsey-quarterly

increase in quantities being produced bumps into the physical, biological, climatic and geological limits outlined above. The digital industrial revolution, contrary to the previous ones, is thus set to **massively reduce the number of hours being worked by humans**.

The accumulated capital of integrated systems, networks and institutions, with features of fixed-cost economics, and the prospects of massive reductions in the number of hours being worked because of digitalisation, have caused, and will continue to cause if nothing is done, **enormous unemployment** and **massive inequalities** of income, of wealth and of personal safety, reverting 150 years back to Victorian levels. This has dramatic and negative consequences on violence, political radicalisation, physical and mental health, and learning capacities[30]. The issue becomes that of the **sharing** among humans of the fantastic **value**, **labour productivity**, and **technical efficiency** being created by the (digital and others) integrated systems, with no simple mechanism, such as that of the market, to guide us. It is thus a fully political problem, in which we must agree on what "fairness" means, for all of us.

5 Multinational corporations concentrate power, to the detriment of workers, suppliers and governments, and evade their (tax and other) obligations

Multinational corporations have grown into the major loci of power of the contemporary world.

By leveraging the technical efficiencies of scale brought by fixed-cost economics, and by accumulating immense productive capital of all sorts (equipment, scientific & technical knowledge, processes, software, trademarks), they have out-competed their smaller competitors in terms of cost, quality and ability to access customers and to extract high prices from them. They have also set up entire eco-systems of smaller, dependent suppliers, so that their real power over societies goes way beyond their visible workforce and activities. As an illustration, **50 major multinational corporations** (Wal-Mart, Procter & Gamble, General Electric, Coca-Cola, Nestlé…) manage **60% of global trade**, but employ directly only 6% of the 117 M people that actually work for them, while the remaining 94% are located in the deep and opaque layers of successive sub-contractors, mainly in the global South, making some of these multi-national corporations among the **largest employers world-wide**, with up to **10 M workers** depending on a single company (Wal-Mart)[31].

These international value chains present **deep power inequalities**. Some companies, located at the nodes in the value chain where the processes display most of the fixed-cost features identified above, build monopsony (or monopoly) positions, and extract from their suppliers (resp. from their customers) a **rent** based on their position of power in bargaining for **price** and for legal terms & conditions in the contract. When bargaining with multiple, fragmented suppliers (resp. customers), the multinational corporation can threaten to choose one or the other, at no cost, while the supplier (resp. the customer) has no other choice than to conclude a contract with the corporation – or none

30 Wilkinson, R. and Pickett, K. "The spirit level. Why equality is better for everyone", Penguin books, 2010, the main messages of which are accessible at: https://www.equalitytrust.org.uk/spirit-level

31 International Trade Union Confederation – ITUC: "Scandal. Inside the global supply chains of 50 top companies", Frontlines Report, 2016, downloadable at: http://www.ituc-csi.org/IMG/pdf/pdffrontlines_scandal_en-2.pdf

at all. Building coalitions of suppliers (resp. of customers), in an attempt to counterbalance the bargaining power of the multinational corporation, is currently forbidden by competition law that prohibits cartels.

These **unequal power relationships** between suppliers and customers epitomise when relating to the most fragmented of all suppliers: the **worker** providing his/her labour. The traditional answer to this unequal power relationship on the labour market, between concentrated employers and dispersed workers, has been **collective bargaining**, whereby workers built stable and legally recognised coalitions – the **trade unions** – to bargain salaries and working conditions collectively, in an explicit (and hard-won) exception to competition law. These collective bargaining institutions, where they exist, are being fiercely combated by corporate interests, by legal lobbying in favour of de-regulation, and too often also by borderline "trade union busting" methods. An essential **weakness** however of the trade union movement is that its collective bargaining is performed at **national level** at best (and often only at the scale of the company, or even of the establishment) – whereas multinational corporations operate trans-nationally, and can play workers against each other across borders. European and international trade union (con)federations exist, but their role is essentially that of coordinating national actions, with no capacity to take and to enforce decisions (e.g. on trans-national collective bargaining).

Multinational corporations not only play suppliers or workers against each other. They do the same with **governments**, and have the law changed, rather than obey the law themselves.

In their investment decisions (or in their decisions to close / wind down a location), they create (or destroy) jobs and economic activity, so that nation-states, regions and cities compete against each other to convince them to settle in their constituency (or to "restructure" somewhere else). In this international beauty contest, some nations, regions or cities engage into constructive strategies of building up competencies, infrastructure and a market with demanding, forward-looking legal, social and environmental requirements. Too many however, engage in a downward and suicidal spiral of tax exemptions, subsidies, and dismantling of social and environmental regulation – the "**race to the bottom**". They do so under the constant pressure of corporations that threaten them to destroy jobs (and corporate tax base), if these governments to not follow their calls for lowering corporations' immediate costs, taxes and regulatory obligations – whatever the long-term consequences may be for the environment, public health, social cohesiveness or the education level of the population.

The most visible aspect of this destructive behaviour of corporations (and of the very rich and obscenely rich) is that of **tax avoidance** and of **tax evasion**[32]. While the former is formally legal, and the other is illegal, the fact that gigantic cash-generating machines such as the US-based Internet giants Google or Apple pay taxes at a rates orders of magnitudes below those that even the lowest paid cleaning person does[33], has caused widespread, and legitimate, outrage.

32 Shaxson, N. "Treasure Islands. Tax havens and the men who stole the world", 2010, Vintage, described at: http://treasureislands.org/the-book/

33 Apple paid an effective a corporate tax rate of 0.005% in 2014 in its Irish operations covering its whole European business, which had generated over USD 22 billions in profit. cf. European Commission, Decision on State Aid implemented by Ireland to Apple, C(2016) 5606, full text downloadable at:

Multinational corporations incur widespread, and deserved, criticism also because of their disproportionate capacity to influence law-making by **lobbying**. Whereas it is legitimate that they, like any stakeholder, have the opportunity to express their wishes and constraints to a legislator that may be unaware of them, it is far less legitimate that they dominate the technical (and political) debates on all subjects where their interests are at stake. Figures of this corporate dominance exist where it is most visible, and made public by welcome (but still very imperfect) transparency institutions[34], in the centres of political power such as Brussels, and show that corporate interest representatives outnumber those of other interests in society combined by a factor of 3[35]. The dominance of corporate lobbyists is not only quantitative. It is also technical and intellectual. Because of a lack of qualified civil servants (itself fuelled by an anti-State and anti-tax rhetoric that reduces public budgets to the bone), corporate lobbyists become the players that have the greatest technical knowledge of the policy field to regulate, and end up being in the insane situation of regulating themselves, situation epitomised in the regulation of the financial system[36].

By playing polities against each other at all scales (from municipalities to full nation-states), by their hold on regulatory and taxation policymaking, multinational corporations have evolved towards a situation where they can **privately appropriate the value added** by society (e.g. by public investment in science and technology[37]), **mutualise their losses** and **evade their duties and obligations**.

This hollows out public budgets. It is a **negation** of **democracy**, of the **rule of law**, and of the principle of **equality in rights**. It generates, among all other members of society, a legitimate, and dangerous, feeling of helplessness and of dispossession of one's individual and collective future.

6 Ordinary citizens and workers are thrown into poverty and precariousness

Symmetrically to the concentration of wealth and power in the hands of multinational corporations, recent **austerity** policies world-wide, and specifically in the European Union, led to a massive surge in **poverty** and **precariousness**. Whereas these policies can sometimes work when implemented in isolation by a single nation-state[38], they lead to a disastrous **race to the bottom**

http://ec.europa.eu/competition/state_aid/cases/253200/253200_1851004_674_2.pdf, press release available at: http://europa.eu/rapid/press-release_IP-16-2923_en.htm

34 e.g. the Transparency Register of the European Commission and Parliament: http://ec.europa.eu/transparencyregister/public/homePage.do

35 Indicator: number of meetings with the European Commission in Brussels in 2015. Cf. Transparency International : "7,000 and counting Lobby meetings of the European Commission", (2015), downloadable at: http://transparency.eu/wp-content/uploads/2016/09/Lobby-Meetings-European-Commission-1.pdf

36 Finance Watch: "Representation of the public interest in banking" (2016), downloadable at: http://www.finance-watch.org/ifile/Representation%20of%20the%20Public%20Interest%20in%20Banking%20-%20A%20Finance%20Watch%20Report%20-%202016.pdf

37 Mazzucato, Mariana: "The Entrepreneurial State: debunking public vs. private sector myths", Anthem (2013), a summary of which is accessible at: https://marianamazzucato.com/entrepreneurial-state/

38 Germany since 2005 is often cited as the positive example of the success of austerity policies in a single country: low unemployment, massive trade balance surpluses and even budget surplus, seem to testify for the soundness of the Hartz reforms of the early 2000s. Even this is debatable, for the following reasons: (1) the export successes of German industry are concentrated on machinery (and thus on the investment boom in China) and on luxury automobile brands (and thus on global inequalities) and have little to do with cost reductions; (2) the accumulation in

when every nation-state attempts to out-compete its neighbour in its attempts to bribe multinational corporations to locate its activities locally.

These austerity policies shared one or several of the following features. Under the fallacies of "attracting foreign investment" (using the cheap and easy arguments of lower costs at any price, instead of those, more difficult and longer to achieve, of a well-trained and motivated work-force and of quality infrastructure), of "restoring public finances" (by unilaterally reducing expenditure, and not increasing taxation), of "flexibilising the labour market to facilitate recruitment" (whereas the greatest obstacle to recruitment is the lack of demand), governments in the European Union and beyond have engaged since the 1980s in a programme of systematic **dismantlement** of the **social infrastructure** that made our societies cohesive. **Public services** and networks (hospitals, schools, railways, telecommunications) have been abandoned or transformed into highly lucrative private oligopolies skimming the market for the highest-value customers, and leaving the others without proper service. **Social security** systems are being dismantled: **healthcare** payments are restricted and risk being conditioned by patients able to prove (via digital monitoring systems) "healthy" behaviours that are *de facto* inaccessible to the poor; **pension** payments are increasingly devolved to private insurance companies that select low-risk, high-yield customers and leave the others to be taken care of by what remains of public budgets; beneficiaries of **unemployment** payments are subject to a permanent suspicion of fraud and of insufficiently active job-seeking, which elicits frequent and arbitrary payment interruptions by the administration. The rights of **trade unions** have been systematically undermined: the right to **strike** has been restricted, the **collective bargaining** institutions that enable a fair discussion between employers and employees regarding the sharing of the economic value added have been reduced in scale, from sector to company or even establishment level, thereby reducing the bargaining power of trade unions (and creating the destructive competition on wages between firms in the same sector that sector-wide collective bargaining was designed to avoid). The relation between worker and company using this work is increasingly reverting to the early 19th century model of a purely commercial contract, thereby destroying the accumulated experience of 200 years of **labour law**: bogus self-employment, crowd- and platform work, "zero-hours contracts", temporary agency work, involuntary part-time work are on a sharp rise, whereas the stable employment contract is massively branded by businesses as a relic of the past.

This infrastructure of public services, social security, trade unions and labour law in the European Union constituted the "capital of those who haven't any", the foundations assuring decent living conditions to all citizens, decent wages and working conditions to all workers. They enabled even those with the least education, or with the least family or social support, to have their basic needs fulfilled, and to consider their future, and that of their children, with a form of confidence. They were the basis of the European social and economic model. Their systematic destruction, to the benefit of large corporations, has led to the creation of a large social class of people which are both **poor** and alternating between **precarious jobs** and **unemployment** – the global "precariat" as a

physical debt (the accumulated deterioration of infrastructure for lack of maintenance) is not part of financial accounts; and (3) the rifts between the well-protected elite of workers in finance, industry, and public service and those surviving with "Mini-Jobs" may be a root cause of the recent surge in far-right populism in a country reputed for its political stability.

contemporary avatar of the 19th century proletariat.

Under these conditions, people focus 100% of their attention and energy on short-term, small-scale issues of immediate concern to them: finding food to feed them and their children for the next day, finding work, avoiding being thrown out of their home. They are in a permanent state of stress.

This worsening of the condition of the most vulnerable class in the population has further increased **economic and social inequalities**, from the bottom of the social scale (whereas the concentration of wealth and power in multinational corporations described above widens it from the top).

This deterioration in the economic and social condition of vast populations also has negative consequences on **participation** in **democratic processes**.

As the Athenians of the 5th century BC already identified, constructive participation in democratic political or social processes requires a capacity to **broaden** one's perspective from the individual to the collective, from the immediate to the long-term calendar of public policies. It requires also some **free time** to gather information, to engage in a thorough discussion with others, to convince and to be convinced.

These requirements are in exact opposition to the situation of poverty and precariousness that recent policies, based upon free-market ideology, made to large fractions of the population, in the European Union and more broadly in the world. Poor and precarious populations are thus not only deprived of economic and social welfare, they are *de facto* **deprived** of their **civic rights**, and of their capacity to participate in political decision-making. This results in massive **abstention** rates in political elections, and, more dangerously, in a deep **erosion** of the legitimacy of **democracy** itself.

7 As a consequence, international and intra-national migrations have become a major policy challenge

All the challenges described above generate **conflicts** and **poverty**. Conflicts easily take the form of extreme violence, since their protagonists are in the desperate situation of having "no future". Poverty threatens life itself, when the agricultural capacity of whole regions is destroyed by extreme climate events (droughts, floods, hurricanes, rise in sea levels). Violent conflicts and life-threatening poverty cause people to flee, by the thousands, and – increasingly – by the millions.

As a result, the world counts as of 2016, **22.5 million refugees**[39], i.e. people seeking protection in another country against explicit **violence** against them (due to persecution, political, ethnic or religious conflicts, or war), an increase of 3.4 million (i.e. 17 %) compared to the previous year. Additionally, **40.3 million** people are **Internally Displaced People**, i.e. they have fled violence or persecution by being displaced within their own country, an increase of 6.9 million (i.e. 20%) in one year[40]. In addition, **21.8 million people** have been forcibly displaced by sudden-onset extreme weather disasters (floods, storms, drought) every year from 2008 to 2016, and can be described as

39 Among which 17.2 million protected by the United Nations High Commissariat for Refugees (UNHCR) and 5.3 million Palestinians registered by the United Nations Relief and Works Agency for Palestine Refugees (UNRWA).

40 UNHCR "Global trends. Forced displacement in 2016", downloadable at: http://www.unhcr.org/statistics/unhcrstats/5943e8a34/global-trends-forced-displacement-2016.html

climate-displaced persons[41]. In 2015, the world counts a stock of **244 million international migrants**, i.e. people residing in a country different from their country of birth, of which 85.3 million migrated from the global South to the North, but 90.2 million from one country of the global South to another[42]. In addition, a stock of **50 million irregular international migrants** is estimated to exist globally.

Whatever its cause (political violence and persecution, climate-related disasters or poverty), an influx of population from abroad stresses the available resources of the host country (water, food, energy, homes), but also increases its available labour force, and hence its production capacity, specifically when the well-educated migrate, in a "brain drain" phenomenon increasing the polarisation of development between countries and regions. As a result, **migrations** have risen to a **major policy challenge**, for the rich countries of the European Union, but even more so for the immediate neighbours of conflicts[43] or of climate disasters.

8 These global issues are political problems that can only be solved by cooperative, long-term political agreements

All the global issues described above are essentially **political** problems, because the only, but immense, difficulty is to find an **agreement** between **all** stakeholders on a **fair sharing** of the costs, benefits and risks generated by the necessary transformation of our societies; i.e.:

- the quantitative reduction in final consumption and in hours being worked by humans when our production and consumption patterns adapt to the preservation of our climate and to the regeneration capabilities of our environment, and undergo a transition towards a sustainable, frugal, zero-carbon and circular model;
- the adaptation of our social redistribution models when the elderly and chronically ill represent a substantial proportion of the total population;
- the productivity and efficiency gains brought by fixed-cost integrated technical systems, and specifically by digital technologies;
- the transfer of political and economic power away from the multinational corporations where it is concentrated, and towards the dispersed majority of the weaker members of society;
- the eradication of poverty and precariousness;
- the root causes and consequences of migrations.

When mentioning all stakeholders, we mean all human and non-human beings, across national, linguistic and cultural boundaries, and even across time, between us and future generations.

Despite all its promises, and despite all the bewilderment that it generates, **technology** will solve

41 Oxfam: "Uprooted by climate change", 2017, downloadable at: https://oxf.am/2zzGJvs
42 International Organisation for Migration (IOM): Global Migration Trends Factsheet, 2015, downloadable at: http://gmdac.iom.int/global-migration-trends-factsheet
43 One inhabitant in 6 in Lebanon is a refugee, the highest proportion world-wide.

none of the issues described above. The most clever "clean" technology can only take off and substitute a "dirtier" one if the regulatory and economic conditions (1) give a price to environmental externalities, and enable it thereby to gain economic advantage over its competitors by saving natural resources, and (2) protect it from misleading "green-washing" claims by its competitors. The "smartest" automobile traffic management system in a city is powerless against the fact that the engine of a car consumes ca. 100 kW of power, while that of a bicycle only ca. 0.1 kW (100 W), i.e. one thousand times less! The most advanced home care robot will not solve the issue that its design, construction and operation draws resources for an old or chronically ill person that could have been used to educate a child or a teenager. Technology becomes part of the problem, when the rules that govern its benefits (specifically those regarding Intellectual Property Rights on patents, software, trademarks, models, access to data…) lead to concentration of wealth and power, and not to its distribution. Technology is not, and cannot, be the answer to our woes.

Another means that has historically been used to solve the greatest part of social distribution issues has been **economic growth**. When more wealth is available for society as a whole every year, as was the case in the 1950s and 1960s in Western Europe and the United States of America, or in China since the 1980s, a redistribution of this additional wealth is sufficient to satisfy everyone, because everyone gets more. Because of the bio-physical limits placed on the growth of our material and energy consumption (outlined § 2), this option is closed to us, for ever.

Since technology is no magic wand, and since growth is no option any more, we must dedicate all our efforts to the formidable task of finding political **agreements** on all the high-stake issues outlined above regarding the fair sharing of costs, benefits and risks associated with the deep, revolutionary transformations that the 21st century expects from humankind.

Because of the **global inter-dependencies** that have irreversibly built up over the last century, these agreements will need to be **cooperative**, at the unprecedented **scale** of the **whole world**.

These global inter-dependencies are: (1) the communications and transport **networks** connecting people and places with information, energy, material and population flows, (2) the i**ndustrial value chains** connecting suppliers and customers that need each other, and (3) the **scientific knowledge** of physical, biological and geological **inter-relations** between phenomena (regarding the climate, water, mineral or biological resources) that are distant in time or location.

These global inter-dependencies (and specifically the last one) have irreversibly connected and unified geographic areas and peoples that were previously separated. As a result, **all humans** are **inter-connected** and **inter-dependent**. No place, not even the most remote island, can claim to remain isolated from them. There is thus no means to escape the common fate by attempting to isolate oneself in a safe, distant haven. The solutions and agreements must be **cooperative**, or they will not exist.

The scale of the transformations to be agreed upon is daunting. These transformations cover almost all aspects of our material, political, economic and social lives, and must revert decades if not centuries of sunk costs in inappropriate institutions and infrastructures where we are almost locked-in. The agreement must therefore bear on **long-term commitments**, over decades or

more.

Building cooperative, long-term, large-scale agreements is no trivial task, specifically when considering that reaching agreement has been the essential problem of human societies and is the purpose of almost all institutions in politics (whose purpose is to take decisions considered by all as legitimate), in economics and in society at large (which are essentially based on contracts that describe mutually-agreed commitments)[44].

An **agreement** means: (1) that the rights, obligations and prohibitions that it contains are considered as **legitimate** by all parties, and (2) that an institution exists to **enforce** this agreement once it is officially adopted (e.g. signed). We will consider these two aspects successively in the following two chapters, and identify the conditions for these aspects to exist.

The central role of **agreement** and of **cooperation** in the resolution of the many issues facing humankind in the 21st century justifies the name of **Society of Agreement** that we gave to our long-term objective and the statute of **cooperative** that we have chosen.

44 Boltanski, L.; Thévenot, L. "On Justification: Economies of Worth", Princeton University Press, 2006