


BACK TO THE FUTURE

Green recovery from the crisis



GREENPEACE



Back to the future
May 18, 2020

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Pernik, October 2019. A group of activists stood at the gates of Republika Thermal Power Plant (TPP) and placed a wooden gate with the inscription "Museum" on it. This power plant was built in 1951. The question they asked was how long this facility from the past would be poisoning the air. When was this coal-burning plant transformed into a museum.

Pernik, May 2020. The wall of the artificial lake where Republika TPP stored ash and other waste from coal combustion burst. The facility had had problems for years and pollutants often leaked into the Struma river. The waste depot was supposed to be closed and recultivated in 2016, but despite the rupture of the wall, the management of the plant stated that they would continue to dump waste there. There was no new depot, and even if one had been developed, it would still be sitting between two populated city neighbourhoods.

The concepts and policies in the energy sector in Bulgaria are almost 70 years old. The way electricity is being generated in this country holds us hostage to the past and at the same time fuels climate change and pollutes the air, water and soil.

We are publishing "Back to the Future" in order to raise the question on how we are changing our human activities to have a better life in a healthy environment. The current crisis is an opportunity to move into the future with new practices, not to lock ourselves into the past. We hope that this document will initiate real discussions and projects, e.g., about solar district heating, energy cooperatives, innovation and citizens and households producing their own energy for their own purposes.

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A Sign of Threat

The crisis caused by COVID-19 is a sign and a dress rehearsal for threats, such as the destruction of nature and climate change, that are caused by human activity. To learn the lessons from it, we need to know where we fail, but also where we are successful as an economy and society.

Far away from Pernik and from Bulgaria, at the end of January 2020, for the 30th time in a row, 2,000 representatives of the world's political and business elite board 309 private jets to visit the ski resort of Davos for the annual meeting of the World Economic Forum. (WEF). The WEF provided participants and the general public with its Annual Risk Assessment², which recognised that economic growth was slowing down, as well as, an analysis of systemic risks threatening humanity, mainly related to climate, but also including economic inequality, nuclear weapons and pandemics.

Only three months later, the resort of Davos, like most other tourist sites around the world, is still closed, planes are grounded, all economic growth forecasts are trashed, and the world is gripped by a pandemic crisis that seems unparalleled and even unthinkable.

"Seemed" is the key word here. Alas, the COVID-19 crisis is not unparalleled. In the last decade alone, the world got away with several pandemics: H5N1 bird flu (2010–2011), MERS respiratory syndrome (2012), Ebola (2014–2016 and 2019) and Zika (2015–2017)³. Unlike COVID-19, however, these viruses were not easily passed on from human-to-human but the common denominator was that they all belonged to the group of so-called zoonoses. Their traditional recipients were animals, i.e., poultry and migratory birds, bats, monkeys, etc., but subsequently the viruses were able to infect humans.

This is no coincidence. From 1970 until today, 60 per cent of the populations of wild vertebrates inhabiting the earth have disappeared⁴. Today, the total human population of 7.8 billion makes up about 36 per cent of the total biomass of living mammals on the planet with as much as 60 per cent of the total biomass being domestic animals – mainly livestock and pigs - and only 4 per cent account for wild mammals⁵. Industrial livestock is one of the main reservoirs of pathogens and a link through which zoonoses are transmitted from wild animals to humans⁶.

The consumption of biomass and natural resources needed to maintain this and other economic systems has been growing staggeringly and poses a much greater threat

than the number of human beings who inhabit the world. In 2019, humanity consumed 100.6 gigatons (billion tons) of natural resources, including 24.6 gigatons of biological resources (plants, animals, crops) and only 8.6 per cent of all resources used were returned for reuse in the economy⁷. Of course, energy and resource consumption are not evenly distributed, e.g., the average US resident consume their "due" biocapacity from the planet for one year within 3 months, while the average resident of Indonesia manages to distribute the same consumption for 4 times longer timespan – throughout an entire year⁸.

Alas, industrial agriculture and industry in Indonesia, Brazil and the tropics of the planet are the main causes of deforestation. In 2018, the Earth lost about 120,000 square kilometres of forests, i.e., an area larger than Bulgaria, 36,000 of which are natural tropical forests, such as those in Borneo and the Amazon – the region richest in biodiversity, including pathogens unknown to man.

Worse, illicit trade and illicit consumption of wildlife products worth \$ 26 billion a year, is most likely directly responsible for the COVID-19 pandemic, which began at the animal market in Wuhan, China^{7,10}. It is not known exactly from which wild species COVID-19 originated, but a previous epidemic with a similar coronavirus strain – SARS, was traced directly to its original source, i.e., illegally traded Asian civets (also known as Indochinese musang – *Paradoxurus*)³.

Climate crisis additionally worsens the problem as warming helps pathogens spread to new regions while habitat destruction, as by the catastrophic fires in the Amazon and Australia, make biodiversity and human population more vulnerable. Forecasts are not bright. If humanity allows global warming to exceed the 1.5 °C threshold above pre-industrial levels, which was set in the Paris Agreement, this would expose 410 million people worldwide to severe droughts and more than 65 million people to devastating heat waves¹¹. If the thermometer shows an increase of 2 degrees, more than 1.5 per cent of world economy production will be erased each year after 2050, practically eliminating the entire expected annual growth. If we do not stop emissions and the world warms by 3.6 °C by

2100, what is the trend at the moment, a much larger economic downturn may be witnessed. For comparison, it is currently expected that the COVID-19 pandemic and the associated restrictive measures will reduce carbon emissions by 8 per cent by 2020, just what is needed to implement the Paris Agreement, but at the cost of global economy shrinking by 6 per cent by 2020¹².

Thus, the crisis caused by COVID-19 is a sign and a dress rehearsal of those threats, such as destruction of nature and climate change, which have been caused by human activity. To learn the lessons from it, we need to know where we fail, but also where we are successful as an economy and society.

To think that the COVID-19 pandemic is an unthinkable event means not paying tribute to those scientists, professionals and healthcare institutions that have been warning and preparing us for such pandemics for decades. Thanks to these efforts and to the commitments made by politicians, the rate of infection was effectively slowed down in countries which imposed restrictive measures, Bulgaria being among them. More importantly, the tools for analysis and decision-making, including exponential curves and complex mathematical models for managing growth, have been well explained to and appreciated by the general public. This by itself gives hope that the first step in solving complex problems such as pandemics, biodiversity loss and climate change, i.e., make sense of them, is entirely within our power.

In this difficult period of time, politicians, citizens, companies and institutions are learning to take decisive steps and make bold decisions. If these steps are effective and the solutions sensible, we cannot only recover faster from the crisis but also reduce the impact we make on the planet by transforming our economy, energy and infrastructure to become "greener" and more resilient to crises.

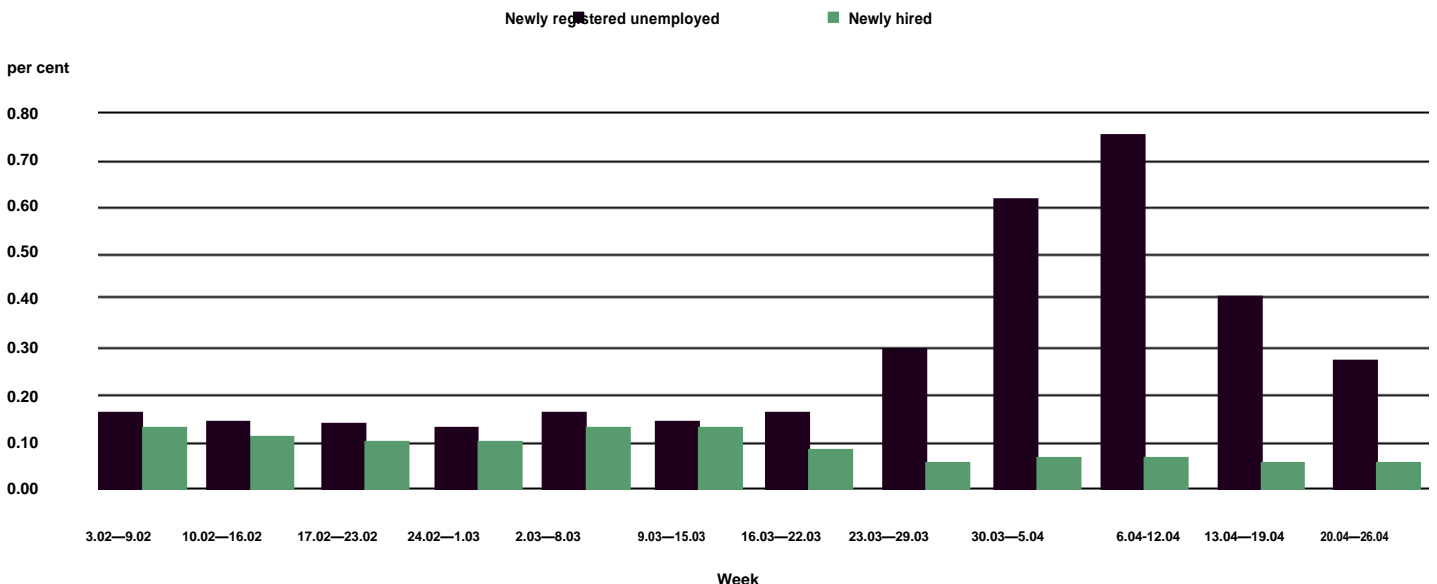
Stagnation and recovery of the economy

The COVID-19 crisis has damaged some of the most unsustainable sectors, but has cost the income of many of the most vulnerable workers and companies. A "low-touch" economy can secure a low-carbon future.

The best way to limit the spread of the virus in the short term is social distancing. We already know that it works and reduces the number of infected people and victims for a certain period. Will this stagnation in people's activity and their consumption of goods and services not lead to collapse of the economy, as economists, politicians and business lobbies have warned us?

The damage to the economy inflicted by the virus and the restrictive measures imposed are real and their scale is serious. According to the National Statistical Institute (NSI) of Bulgaria, more than 105,000 unemployed persons were officially registered for the first 6 weeks of the state of emergency from 16 March to 26 April 2020, an increase of three times compared to the previous 6-week period (Figure 1). The rating agency Fitch predicted negative growth of the Bulgarian economy of about 5 per cent for 2020 – a sharp collapse, similar to what is expected for most European countries affected by the pandemic.

Figure 1. Newly registered unemployed and hired people in the period 06.02-26.04.2020.13



Source:

Employment Agency

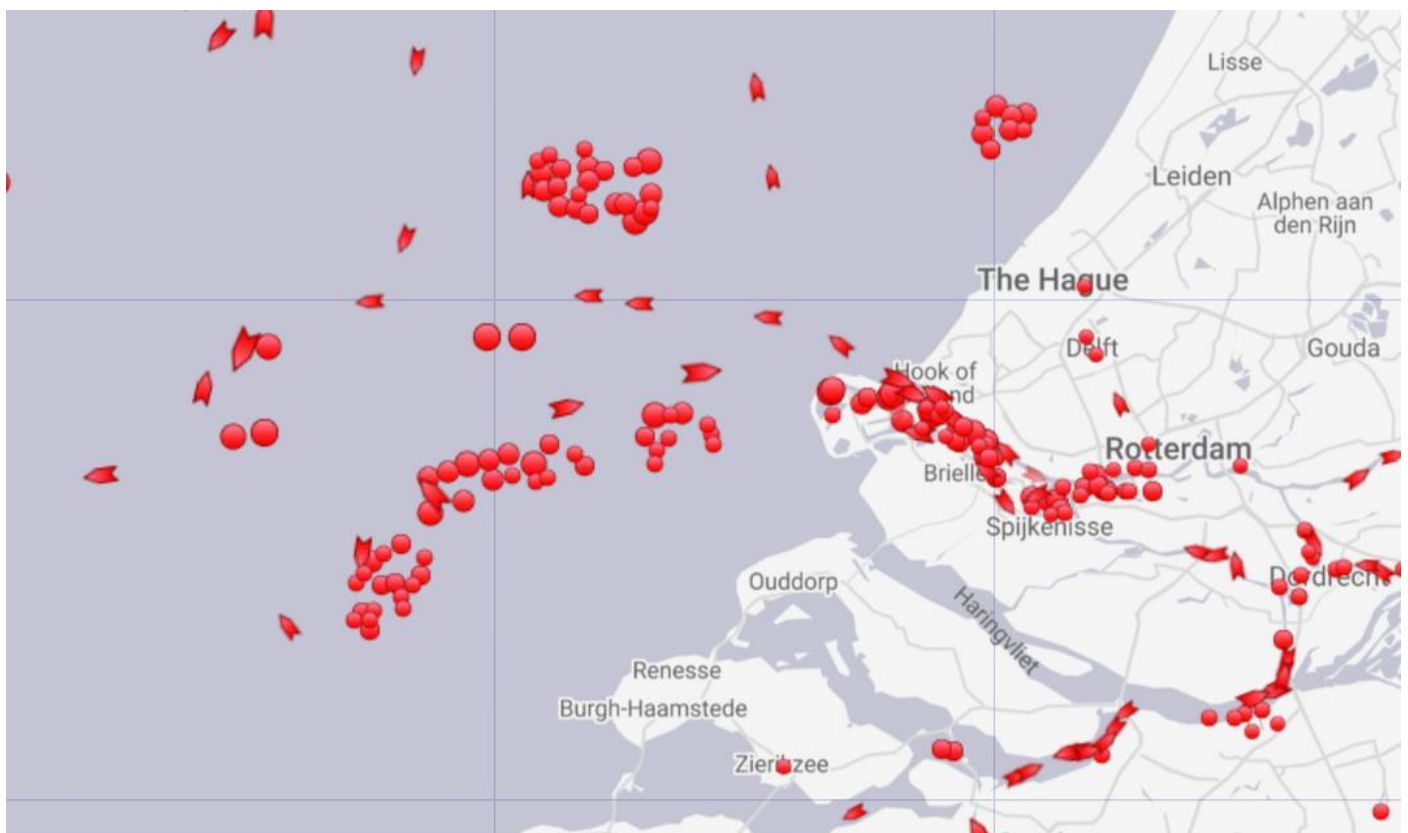
- Data for April is preliminary
- Newly registered unemployed for the period Feb 3-Apr 14 2020 – 139,963
- Registered unemployed people who found employment during Feb 3- Apr 26 2020 – 45,665
- Population of working age as of 31.12.2019 (NSI) – 4,156,198

The summarised statistics and the rates of nominal economic decline mask the much deeper impact that the crisis has already exerted on the most vulnerable groups of the Bulgarian population. Seasonal workers who harvest the produce in many European countries and work for the active tourist season in Bulgaria, are left without a secure income. The same applies to those employed in the services sector, especially those without permanent employment contracts, i.e., the so-called "gig economy", which cannot rely on unemployment benefits and other social welfare. The crisis has disproportionately affected many family and small businesses which provide goods and services to the local economy; they do not have the logistics systems to supply large chain stores and online sales sites, nor do they have sufficient financial reserves to survive during the period of social distancing. Against this backdrop of general unemployment, many "essential workers" and especially medical staff are doing huge amounts of overtime and often without payment under very harsh conditions.

Globally, about 305 million jobs are expected to be lost as a result of the pandemic. The sectors related to travel, events and tourism are the most affected. Meanwhile, some of the so-called low-touch sectors, i.e., those that do not require travel and human interaction, such as online movies and book selling platforms and teleconferencing, have been spared by the crisis and are even growing¹⁶. This is a favourable development, as many of these online services support the employment of content creators, reduce mental stress of people in lockdowns and help them keep in touch with work teams and relatives, while saving energy, waste and carbon emissions.

The biggest carbon-generating industries top the statistic for financial losses and make headlines on layoffs and possible bankruptcies. Oil giant ExxonMobil made its first quarterly loss in 32 years¹⁷, its BP rival saw a 66 per cent drop in revenue for this quarter¹⁸, while Royal Dutch Shell froze operating expenses of \$ 4 billion¹⁹. In April, some 160 million barrels of oil sat loaded in more than 60 supertankers with no port able to accept them due to oil storage facilities topped off, thus increasing the risk of maritime accidents and oil spills²⁰.

Figure 2. Tankers carrying petrol and petrol derivatives waiting to be admitted at the port of Rotterdam, May 6 2020.²¹



The aviation sector is expected to lose between 1.8 and 3.2 billion passengers worldwide in 2020²². Airbus announced it faced a real risk of bankruptcy and laying off many of its 135,000 employees this year²³ and Richard Branson has promised to take a mortgage on his private island to save Virgin Atlantic from bankruptcy when it was bailed out by the British government²⁴.

The world's largest airline, Lufthansa, is incurring a loss at \$ 1 million every hour its planes spend on the ground; EUR 10 billion will be needed to rescue it²⁵. A similar package of EUR 10 billion in loans and government guarantees has already been agreed for Air France-KLM by the governments of France and the Netherlands²⁶. However, European countries continue to negotiate without much success with corporate management on countermeasures to reduce emissions and achieve economic and environmental sustainability.

Common sense makes one wonder whether such costly and chaotic measures to bailout individual companies in high-emission and environmentally harmful sectors, many of which in a difficult financial situation even before the crisis, represent a meaningful investment of taxpayers' money. In the case of the Netherlands, the bailout comes while envisaging an EUR 7 tax per flight since 2021 to promote alternative transport by railroad. Thus, the money comes out of the taxpayer's pocket as a tax to be actually reinvested in the "punished" sector.

Such efforts would make some sense in case of a short-term and temporary economic shock and declining consumption followed by a rapid and complete recovery of the so-called V-shaped economic recovery. However, more and more economists believe that such a scenario is impossible and predict a U-shaped recovery or even only a partial recovery in the form of L-shaped stagnation, involving lasting transformations and changes. ■

Table 1. Prospects for some business sectors in terms of rate of economic recovery from the COVID-19 crisis. Source: Board of Innovation¹⁶

Recovery rate	Mildly affected	Strongly affected	Catastrophically affected
	Consumer goods	Petrol and natural gas	Travel and hospitality
V-shaped – up to 6 months. Rapid mastering and strong economic stimulus	Domestic goods	Surviving. Getting ready for a very slow recovery.	Immediate closure of a big chunk of the business and getting ready for restart.
U-shaped – up to 18 months. Keeping social distancing and stimulus for a long time.	Looking for growth and market share in competition.	Innovation is needed to stay on the market.	Innovation is needed to stay in the market. Mass bankruptcies are possible.
L-shaped – up to 3 years. Unsuccessful control over the virus, mass bankruptcies.	Aggressive search for market share and growth.	Total change of business model or bankruptcy.	Certain bankruptcy of some businesses. Investors are leaving this sector.

In addition, more and more economic experts and business people agree that short-term financial incentives and other measures should back the long-term goals related to climate change mitigation goals – in particular the goals from the Paris Agreement. On May 3, 2020 declaration²⁸ addressed to the country leaders and backed by the UN and over 1,300 institutional investors representing assets worth USD 35 trillion, 5 key points for the sustainable recovery from the crisis are set:

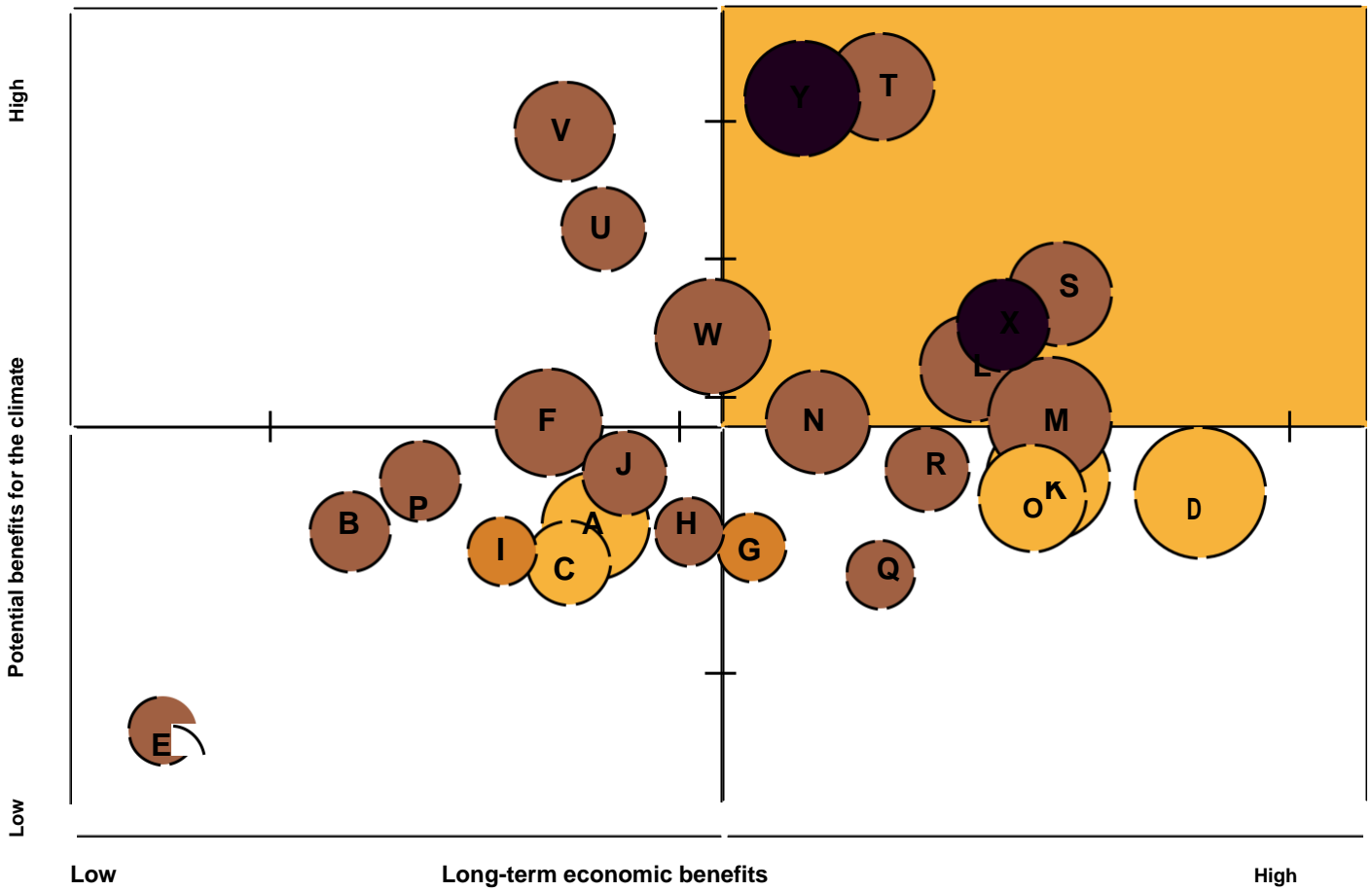
1.	2.	3.	4.	5.
Support for affected workers with a focus on creating green jobs.	Implementing the Paris Agreement, to avoid future humanitarian crises.	Commitment to carbon neutrality by 2050 for state aid recipients.	Prioritise emission-free solutions and technologies, not the high-carbon sectors.	Mobilise all investment resources and capacity in decision planning.

An in-depth assessment of 196 policies for incentives made by 231 leading economists in a study by the Oxford Smith School of Enterprise and the Environment shows that "green" incentives, especially those aimed at investing in renewable energy, energy efficiency and green infrastructure are more cost-effective than brown policies supporting high-carbon industries²⁹. Particularly promising in economic terms are those interventions aimed at energy saving and building renovations, which can be implemented with minimal capital investment and planning, as well as, interventions which aim at afforestation and restoration of ecosystem services in nature parks and agricultural landscapes involving a lot of workers while complying with the rules of social distancing.

In terms of long-term impact of anti-crisis interventions on climate change mitigation and adjustment, apart from those indicated, there are others discussed, too, which are interventions aimed at education and retraining redundant workers to seek jobs in high-tech niche industries, ▣

Figure 3. COVID-19 mitigation interventions that lead to long-term benefits for the economy and have a positive impact on climate change.

Source: Oxford Smith School of Enterprise and the Environment²⁹



The letters from the alphabet refer to the measures:

Legend:

Measures at the top right quadrant (more favourable for the climate and the economy):

- T) Investments in clean energy infrastructure
- Y) Investments in clean energy research and development
- Z) Connectivity for the new infrastructure (incl. electric cars)
- X) General research and development
- L) Investments in education
- M) Investments in healthcare
- N) Retraining workers
- W) Building capacity for adaptation and response to disasters

Measures in the bottom left quadrant (most unfavourable for the climate and the economy):

- E) Bailout of airlines facing
- B) Controlled bankruptcies
- P) Support for agriculture
- I) Tax deferral for businesses
- C) Liquidity support for large companies
- A) Deferral of loan repayments
- F) Bailout of institutions and organisations
- J) Corporate tax cuts
- H) Income tax cut
- G) VAT and other indirect tax cuts

Number of experts having evaluated the interventions

○ 157 experts

○

○ 34 experts

Speed of impact

Fast
Slow

such as clean energy and sustainable food production. Direct investments in innovation, i.e., research and development (R&D), specifically in the field of energy, as well as, investments in infrastructure for charging electric vehicles and other forms of sustainable transport can have a positive impact. It is noteworthy that the Bulgarian and a number of European governments are already resorting to or considering some of the most counterproductive measures in the long run in economic and environmental terms, e.g., tax cuts, especially corporate business taxes and indirect consumption taxes, as well as, ill-considered state aid and interfering in non-transparent and environmentally destructive businesses such as aviation, industrial agriculture, intensive livestock farming and mass tourism. Sectoral pressure partly explains the political nature of such actions, but it is by no means clear how such measures will help household incomes or whether they will contribute to the long-term sustainable transformation of companies in these sectors.

Far more meaningful, but also more complex to implement interventions, such as targeted strategic investments in health, energy and green energy infrastructure are completely neglected. Measures which are much easier to implement are constantly overlooked to support the income of affected workers and households over time of the crisis or permanently. Against this background, some countries which are leaders in anti-crisis measures, such as New Zealand, are already proposing the so-called “well-being budgets” specifically aimed at improving the health and financial status of households and offering revolutionary new indicators for development and success³⁰.

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Significance of the Deal

The European Green Deal of the European Union was adopted before the pandemic, but it contains the most important decisions vis a vis the recovery from it. Bulgaria should make use of this opportunity.

It is crystal clear that in order to put to practice most of the anti-crisis measures and investments recommended by the experts, the mechanisms and instruments of national and European structural funds and programmes will need to be utilised. The EU Structural funds and programmes for the forthcoming period 2021-2027 fall within the framework of the European Green Deal (often referred to as the Green Deal), proposed by the President of the European Commission, Ursula von der Layen.³¹

The Green Deal is an opportunity to accelerate the transition to zero emission and circular economy and the transformation of high-carbon industries impacted by COVID-19. The measures and initiatives which were envisaged in the original plan overlap to a large extent with those that are valued as the most beneficiary for both the climate and the economy, namely^{32,33}:

- **50-55 per cent reduction of emissions by 2030 compared to the base year 1990, mainly aimed at the development of renewable energy and integration, as well as, the hydrogen economy;**
- **Zero-emission transport by 2050, based on electric and hydrogen transport;**
- **Tripling the rate of energy-related renovation and refurbishment of buildings;**
- **A new protection strategy for forests and ecosystems, including afforestation; ▣**
- **Large-scale investments in a circular economy and 70 per cent recycling of packaging by 2030;**
- **Sustainable agriculture and reduction of chemical pesticides, fertilizers and antibiotics;**
- **A "fair transition" mechanism for coal regions worth EUR 100 billion.**

Although these measures are not sufficient to achieve the reduction of emissions in EU countries that is in line with the scenarios for global warming threshold of 1.5 degrees above the pre-industrial era levels, the latter mechanism is of particular importance for Bulgaria and Eastern Europe. Financing the transition beyond coal may largely ensure retraining, reduce the structural long-term unemployment caused by this transition, and support economic entrepreneurship. Such measures are welcome in the face of an unemployment surge and a slow L-shaped recovery caused by the COVID-19 pandemic. According to the initially proposed plan, Bulgaria may avail of EUR 458 million from the fund³⁴, as well as of another EUR 450 million from the modernisation fund. Moreover, the government and private businesses will be able to apply for investments of EUR 4.5 billion, which will be guaranteed by the EU and the European Investment Bank.

This mechanism setup would give a chance for real, long-term, integrated economic development not only in individual areas (NUTS-3), but also in two whole planning regions (NUTS-2) in Bulgaria – the Southwest and the Southeast, where coal mining and coal power generation are concentrated. The integrated development of all sectors is key to achieving a real transition to sustainable, circular and zero-emission economic models, which will pilot these regions for Bulgaria.

Unfortunately, for the time being the Bulgarian government is not making the most of the opportunities provided by the Green Deal, but rather what prevails is the short-term interest dictated by the desire to maintain the status quo.

At a meeting of ministers of energy held on April 28th during the Croatian presidency, Bulgaria took the position of urging for the establishment of a separate Fair Transition Fund focused on coal regions. Meanwhile, however, this country requested "the introduction of temporary derogations from the

legally established rules and deadlines in order to limit the pressure on industry, preserve jobs and speed up the recovery process" concerning the same sectors³⁵. In contrast, most ministers voiced their support for a joint resolution which favoured that the Green Deal should remain at the heart of both the energy transition and COVID-19 crisis mitigation interventions.

The meeting chair, the Croatian minister of energy, Tomislav Čorić, summarised in the general communication as follows:

"This is the right time to reflect on how the energy sector can uplift the immense efforts which are needed to revive our economies. The clean energy transition towards green growth and climate neutrality can represent a major opportunity to stimulate the recovery of Member States' economies."³⁶

Bulgaria has only limited time to reconsider its position and join the growing number of European countries that are consolidating their commitments and building on their ambition for the Green Deal. 17 EU Member States signed an open appeal with a similar message.³⁷

It is particularly important that key stakeholders, representing the regions concerned, local communities, researchers and NGOs are involved in the decision-making processes and in the planning and implementation of the Green Deal. A positive step in this direction was made with the proposal to establish an Advisory Board to address the issues of the so-called "European Green Deal" in Bulgaria, although there are currently no indications that NGOs and local communities will be included in it.³⁸

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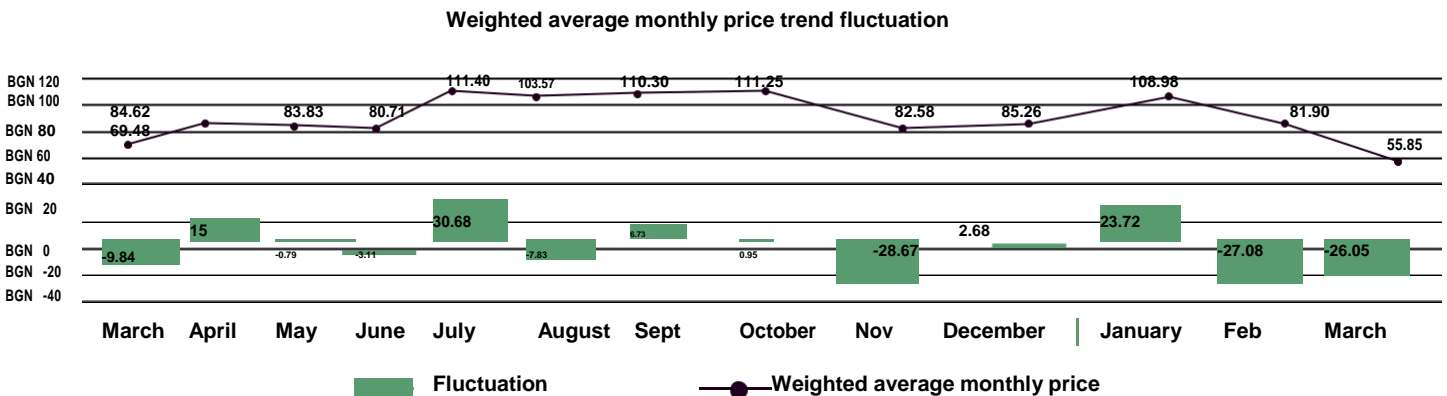
Forgetting the illusions in the energy sector

Energy is a special case as the expected contraction in demand for energy and energy raw materials, the abrupt withdrawal of private capital coupled with the deteriorating financial position and shifted priorities of governments and institutional investors jeopardise huge energy projects in Bulgaria and around the world. They can easily turn into multibillion-dollar sunk costs hindering the transition to renewable energy.

One of the most unsubstantiated myths which circulate in public space is that energy generated in nuclear and coal power plants in Bulgaria is cheap, while energy from renewable sources (RES) is expensive and therefore this country cannot afford to develop RES at the pace at which this is happening in the affluent members of the EU. Many political and public figures in Bulgaria still paint a bright future for nuclear energy and stubbornly insist that more and more funds should be poured in the artificial prolongation of the life of coal-fired power plants which are sinking financially faster and becoming stranded assets³⁹. Such investments cannot be repaid until the end of the operational life of these facilities, or in other words they turn into liabilities for the Bulgarian energy sector and for the economy of the country as a whole.

The largest coal-fired thermal power plant in Bulgaria and on the Balkans – Maritsa East 2, with an installed capacity of 1,620 MW, is an illustration of this. The plant finished 2018 with a loss of BGN 265 million. The loss reported for 2019 amounted to BGN 202 million, with which the total accumulated loss was at BGN 821.4 million. Its liabilities also increased, i.e., by over BGN 250 million last year and have already reached almost BGN 1.57 billion. The situation worsened even more in the first quarter of 2020, when a new loss of close to BGN 64 million was reported. It is worth noting that the smaller annual loss reported for 2019 was due to the smaller quantity of energy generated last year. The total amount of net electricity produced in 2019 amounted to 5,667,680 MWh, while the 2018 figure was 7,328,920 MWh.⁴⁰

In its requests for price approval and cost reimbursement under Art. 35 of the Energy Act submitted to the Energy and Water Regulatory Commission (EWRC) on 31.03.2020, Maritsa East 2 TPP indicated the full cost of energy production equalled BGN 139.55 per MWh and this was its price proposal to the public supplier, the National Electric Company (NEC) at the regulated market⁴¹. By comparison, the chart below displays the weighted average monthly prices for traded energy on the free market in the Market-day-ahead segment of the Independent Bulgarian Energy Exchange (IBEX). The highest registered price was recorded in September last year and amounted to BGN 118.23 per MWh. After the COVID-19 had started, which reduced consumption, prices plummeted to BGN 55.85 per MWh in March 2020.



“The difference between market energy prices and total production costs remains at NEC’s expense and leads to the systematic accumulation of financial losses that threaten its financial sustainability,”, indicated from NEC, acknowledging that “even the total value of variable costs alone⁴¹ already exceeds the average price of energy traded on IBEX⁴²”

It is clear the economic viability of the TPP is questionable even with continued state support.

The other two coal-fired power plants in the Maritsa Basin (Contour Global Maritsa East 3 TPP and AES-3C Maritsa East 1 TPP) also rely on long-term purchase contracts at a much higher price levels than the market price, to maintain their existence. For example, the average purchase price of energy for 01.07.2019-30.06.2020 was set at BGN 159.25 per MWh for Contour Global-Maritsa East 3 TPP and at BGN 225.03 per MWh for AES-3C Maritsa East 1 TPP, respectively.⁴¹ Conversely, the purchase price of energy generated from photovoltaic facilities with a capacity of 200–1000 kWh installed on roofs and facades was BGN 206.34 per MWh, and that of wind power plants ranged between BGN 137 and 191 per MWh depending on the year of installation.^{43,44} In addition, all RES power plants with an installed capacity of more than 1 MW are obliged to sell all energy produced to IBEX and producers receive a surcharge only for the balance above BGN 89 per MWh, defined by the EWRC as an achievable selling price on the free market.^{43,44}

Therefore, it turns out that energy from coal is hardly cheaper than the energy generated from RES, and if the effects on the environment and air quality in the vicinity are added, it will be another confirmation of the old saying: one can’t afford to buy cheap.

Another common misconception which circulates in Bulgaria is that nuclear energy is cheap.

It has been proven indisputably the price that society will pay in the event of an incident with the so called "peaceful atom" will be huge and will be measured not only in financial terms but in human lives (e.g., Chernobyl and Fukushima). However, even if we turn a blind eye to this pending threat, an investment in a new nuclear power plant in Bulgaria would be extremely unprofitable from a purely economic perspective. At present, for example, it involves the construction of a storage facility for low- and intermediate-level radioactive waste only the first phase of which will cost EUR 71,820,000, and the subsequent capital costs for project completion and operating costs for a period of 300 years would completely invalidate any comparisons with renewable energy.⁴⁵

First of all, it should be made very clear the selling price used by the existing Kozloduy NPP (BGN 54 per MWh for a currently regulated market) is very far from the price level that would be achieved by a newly built facility.

Built in a different era and purely state-funded, Kozloduy NPP was never burdened with loans for initial investment to be serviced, unlike the financial framework for Belene NPP. The latter is currently estimated at BGN 20 billion, but it is very likely to swell, considerably at that, in the course of the upcoming negotiations with potential investors. Some of them have already voiced their dissatisfaction with the current conditions of the Bulgarian government for investment without a state guarantee or a long-term contract for the purchase of energy, and announced they will negotiate. Even if assumed that the Bulgarian government has already paid over BGN 1.5 billion for part of the equipment, the selling price of electricity required for the debt on the rest of the financing to be serviced will have to be at over BGN 200 per MWh and the purchase will have to be guaranteed throughout the service life of 35 years. Against the background of the huge opportunities for Bulgaria to make a real transition to low-emission RES-based energy production and energy efficiency, the delusion of enjoying cheap and safe nuclear energy can appear to be a very bad joke. ■

It can be concluded that both methods for energy generation, i.e., from coal and the so-called “peaceful atom”, passed their prime in days bygone: the 19th century Industrialisation and the Cold War era of the 20th century, respectively, as evidenced by the trend of nuclear plants closure and postponement or cancellation of new projects around the world⁴⁶. In the 21st century, humanity is facing the challenge of climate change and the badly needed recognition that we are not cleverer than nature, only part of its complex ecosystems. The senseless violation of the latter can bring about very serious consequences for our health and nutrition as well. In the 21st century, the future belongs to RES technologies, by far, not only because they are more environmentally friendly than fossil fuels. In fact, their major advantage lies in the broad economic flexibility that provide.

For the past two centuries, fossil fuel-based energy production has been demanding more costly technologies which are increasingly concentrated in the hands of fewer people. For the past 20 years, the evolution of RES technologies has been running in the very opposite direction. The price of wind energy has fallen by 70 per cent, while the price of photovoltaic energy plunged by as much as 89 per cent between 2009 and 2019⁴⁵, meanwhile, the number of individuals who are able to make such investments has been continuously on the rise.

From a strategic point of view, the COVID-19 pandemic struck at a time when Bulgaria had not yet elaborated a development strategy for energy until 2030 and 2050. Now is the right time to rethink the political positions and switch from passive waiting to active leadership in the transition to low-emission economy and respectively to maximum utilisation of opportunities for funding under the EU Green Deal for energy efficiency promotion and RES development, including as a means of stimulating economic recovery after the COVID-19 crisis. ■

The return of the people and the new ECO-nomy

In order to implement successfully the necessary solutions and adjustments related to the pandemic and the climate crisis, it is required to start acting as an interdependent community, rather than as a group of atomised individuals. Shared projects between households, citizens and businesses prove that we can do it.

At first glance, the global pandemic that we are witnessing now may not be directly caused by global warming but it is a powerful and shocking wakeup call for mankind, as it is high time we realised we are only a fraction of the ecosystems on Planet Earth and if we do not learn to live sustainably and to respect these ecosystems and their fragile balance, they will change almost certainly in a way we will dislike.

The first test of whether we have learned the lesson the pandemic has taught us, namely that our well-being depends mainly on acting as an interdependent community and not as independent individuals, is how we will approach the other global crisis we are already experiencing – climate change.

The incentives for economic recovery from the health crisis can be a catalyst for faster-than-expected changes in business models and achieving the zero greenhouse gas emissions targets. The accelerated energy transition to low-carbon RES-based energy will in turn result in blurring the roles of producers and consumers, growth of shared economy and dispersed local investment initiatives, and ultimately, in a more flexible and sustainable economy, with care for the environment. In Bulgaria, for example, one in seven people can produce 26 per cent of the electricity needed in the country. "Energy citizens" can act as a leading player on the energy market⁴⁷.

Let's consider how the energy sector in Bulgaria can be transformed from a few large producers and multiple consumers to a large number of dispersed consumers who act as producers as well.

In fact, this constitutes the main goal of the Clean Energy for all Europeans Package of the EU, which will be transposed in the Bulgarian legislation by the end of next year.

The new regulations and policies are increasingly strengthening the role of consumers as active participants on the electricity market, who are able to produce and use electricity from RES, as well as, to sell it independently by setting up energy cooperatives or through an aggregator. ■

Practical example: Solar Energy Cooperatives

Collective, or community, investments enable a large number of households to set aside a relatively small amount from their budgets, which, however, will bring much higher returns and economic benefits to each participant when invested collectively.

In Bulgaria, there are a huge number of concrete blocks of flats with rooftops which can accommodate photovoltaic panels for electricity production or solar collectors for heating water for domestic use by the inhabitants. Both options go down well with the measures for renovation of buildings and energy efficiency and their implementation can draw on funds from European programmes.

If a certain regulatory framework is put in place, no investment may be needed at all.



Photovoltaic panels on rooftops of rehabilitated concrete blocks of flats in East Berlin; Gelbe Viertel project by LichtBlick; Photo: LichtBlick

In Germany, for example, energy suppliers can enjoy a discount on the price of access and transmission of energy through the grid, if they have built photovoltaic panels in the buildings they supply. The rationale for this arrangement is that the energy is produced and largely consumed on site, without grid losses. In East Berlin, a company named LichtBlick has developed this business model with many of the large concrete blocks of flats, where tenants pay lower electricity bills in exchange for the company's right to use the rooftops of their buildings for installing its facilities⁴⁸.

This business model, which gives the right to use the rooftop in return for a discounted electricity bill, is very suitable for small businesses with low energy consumption. Even where the system is installed to cover only personal needs through uniting several consumers in a larger cooperative, the results are both an economy of scale for a lower initial investment and better energy utilisation and, hence, a faster return on investment.

Electricity generation is not the only field for the widespread use of RES. Air conditioning systems in buildings (heating and cooling) can also utilise RES to bring significant benefits for the economy and the environment. ■ |

Practical example: Solar District Heating

Technologies for converting solar energy into heat using solar thermal collectors have already made history and they are widely available and affordable. There are several Bulgarian manufacturers of such panels and such systems can be seen on many rooftops in houses across Bulgaria. They are quite common in small hotels and guest houses on the Black Sea coast, as well as among those consumers who would otherwise use electricity for heating water for domestic purposes.



Solar heating plant in Korsør, Hailskov, Southern Denmark, with a capacity of 8 MW. It was put into operation in the summer of 2019. It will produce 6,500 MWh of heat annually and will deliver it to 5,000 households in the region. Photo: Aalborg CSP A

A not so well-known concept in Bulgaria is the so-called solar district heating where a larger facility supplies a large number of households with hot water for domestic use, as well as, for heating. Solar district heating plants are most common in Denmark, where there are more than 100 of them. They are usually cooperatively owned by associations set up by citizens and municipalities. An example of such a plant can be seen in the town of Gram with a population of 2,600 people, where even the district heating company is managed by the local population by means of a cooperative.⁴⁹

In Bulgaria, the useful solar energy output (kWh/m²) which is produced and supplied by a single solar heating facility is in the range of 10-20 per cent in winter and 80-90 per cent in April to November, therefore, solar energy production in the area of a district heating network could be used predominantly for direct water heating. Depending on the specific conditions of a given district heating system, it is possible for solar energy to be seasonally accumulated and subsequently used for heating, too.

A pilot study carried out by the Institute for Zero Energy Buildings which included 69 residential blocks of flats with a total built-up area of 285,000 square meters in the Apricot Garden district in Varna, Bulgaria with no centralised district heating network concluded that 70 per cent of the needs for heating and domestic water heating in this neighbourhood can be covered by solar energy using solar district heating technologies.■

This technology is extremely suitable for urban settings where it can really contribute to solving the problem of elevated levels of fine dust particles caused by solid fuel heating⁵⁰. Geothermal heat pump facilities can also be used as a complementary energy source. According to various estimates, the geothermal sources in Bulgaria range between 136 and 154 in number. Of these, about 50 have a proven potential of 469 MW geothermal energy production output⁵⁰.

In addition to the transformation of the energy which consumers use and produce, COVID-19 can turn around other aspects of our environment and way of life, the aim being again to achieve a more active presence and participation of the citizens not only as consumers but also as producers of value, products and goods. This can be accomplished with minor changes to the conditions we live in.

Practical example: transformation of city mobility

The demand for social distancing brought about by the COVID-19 pandemic have made it necessary to adopt an emergency traffic regulation in a number of European cities in order to provide more space for pedestrians and cyclists. Due to the reduced car traffic caused by lockdowns and work from home, more space is now available on the roads which can accommodate temporary bicycle lanes.

This positive development underpinned by improved road safety and reduced air pollution from traffic can encourage more people not only to walk or ride a bicycle, thus strengthening the "green" component in the modal split, but also to participate in more business activities which will make use of the vacated space. However, in order to make this possible, some of the traffic restrictions and extensions of pedestrian areas and bicycle lanes need to become permanent.



New bike lanes planned on unused lanes in Milan. Photo: The Guardian⁵¹

The first major European city to announce a scheme for permanent restructuring of its transport system is also one of the most severely hit by the health crisis – Milan⁵¹. The city, which is similar in density and population to Sofia but has a significant influx of commuters and tourists, has announced its plans to build new, cheaper bike lanes which will occupy parts of the lanes, and will also expand pedestrian areas in the central and most visited parts of the city. The speed limit will be brought down to 30 km / h, and the signs and signalling will give priority to cyclists and pedestrians.

Deputy Mayor for Transport Marco Granelli summed up the change as follows: ***"If everyone is driving a car, there is no place left for people to move around, as well as, for commercial outdoor activities outside shops. We have been trying to limit car traffic for many years, so that when we reopen the economy, this space will be taken by outdoor restaurants and bars, and street artists and craftsmen selling their works of art. This type of outdoor economy will have priority in the future and we want Milan to take advantage of it."*** ■

Knowledge is calling for action

The forecasts, estimates, examples and prospects which have been discussed so far have provided a relatively clear vision regarding the anti-crisis measures, incentives, long-term investments and strategic decisions that will support economic recovery with less damage to the climate and the environment and with more benefits for the people. Common sense and a systematic approach are required to deal not only with the COVID-19 aftermath but with future crises as well, the root causes of which will need to be addressed.

Following the principle that the crisis itself offers the solutions, we have elaborated 20 recommendations for the main stakeholders, i.e., INSTITUTIONS, COMPANIES, COMMUNITIES and HOUSEHOLDS. THE OPPORTUNITIES for these stakeholders to collaborate would complement the framework that can be referred to as COVID-20. It is our hope that timely action and determination to deal with the challenges can transform this negatively charged acronym into a household name for our capacity to mobilise our ingenuity and resources to make a positive change. ▣

K	O	B	I	Д
COMPANIES	COMMUNITIES	OPPORTUNITIES	INSTITUTIONS	HOUSEHOLDS
1. To prioritise staff retention	5. To apply measures for social distancing in order to protect the health of frontline workers	17. To reduce carbon and environmental footprint	9. To develop and adopt anti-crisis measures of proven benefit for the climate and the environment	13. To apply reasonable social distancing, reducing unnecessary travel and other expenses with a high environmental footprint
2. To organise their business in compliance with low-touch economy, reducing costs, as well as, emissions and footprint	6. To provide solidarity and informal support to those who have lost their income	18. To obtain energy independence on a local level	10. To support measures for reduction of coal by 2030, energy independence and carbon neutrality	14. To aim for cost saving through energy efficiency and housing energy renovation
3. To switch to RES – proprietary or available on the electricity market	7. To plan and develop community projects for renewable energy and energy efficiency	19. To adopt circular and shared economic models	11. To set up supportive RES legislation with an emphasis on installing decentralised RES facilities	15. To explore possibilities for energy independence by installing micro and rooftop systems for production of electricity and energy for heating from RES
4. To increase investments in development activities linked to emission-free and circular solutions, technologies and practices	8. To set up associations for economic initiatives which improve the quality of community life	20. To improve mechanisms for self-government and include citizens in decision-making process and solution implementation	12. To initiate a wide public debate on adoption of new indicators for development, prosperity and quality of life	16. To opt for low emission public transport (walking, riding and safe public transport)

Reference

Sign of Threat

1. Business Insider. Davos meetings statistics: <https://www.businessinsider.com/davos-by-the-numbers-billionaires-private-jets-security-bill-2020-1>
2. World Economic Forum. 2020 Global risk report: http://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf
3. WHO. Reports on epidemic pathogens, their sources and recent epidemics: <https://www.who.int/emergencies/diseases/en/>
4. The Guardian. Summary of WWF's latest Living Planet Report: <https://www.theguardian.com/environment/2018/oct/30/humanity-wiped-out-animals-since-1970-major-report-finds>
5. The Guardian. Excerpt and infographics about mammalian biomass on the planet: <https://www.theguardian.com/environment/2018/may/21/human-race-just-001-of-all-life-but-has-destroyed-over-80-of-wild-mammals-study>
6. Compassion in World Farming International. 2020 report. "Is the Next Pandemic on Our Plate?", exploring the link between industrial livestock production and pandemics
7. CGRI. Circularity Gap Report 2020 – annual report on resource utilisation and circular economy in the world: <https://www.circularity-gap.world/>
8. Earth Overshoot Day. Information on sustainable use of biocapacity of the planet by countries: <https://www.overshootday.org/newsroom/country-overshoot-days/>
9. Phys.org. 2018 Global deforestation report: <https://phys.org/news/2019-04-tropical-forest-size-england.html>
10. PRI. On China's role and trade in wildlife, interviews with leading investigative journalists: <https://www.pri.org/stories/2020-04-17/covid-19-brings-new-scrutiny-illegal-wildlife-trafficking>
11. UN IPCC. Report on the impacts of global warming of 1.5 °C: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter3_Low_Res.pdf
12. Carbon Brief. Forecasts of the impact of the pandemic on carbon emissions and the economy: <https://www.carbonbrief.org/iea-coronavirus-impact-on-co2-emissions-six-times-larger-than-financial-crisis>

Stagnation and Economic Recovery

13. Bulgarian National Statistical Institute. Newly registered unemployed persons: <https://www.nsi.bg/node/18150>
14. SeeNews, summary of Fitch Rating for Bulgaria: <https://seenews.com/news/fitch-affirms-bulgaria-at-bbb-revises-outlook-to-stable-696390>
15. ILO. Forecast of the global effect of the pandemic on employment: https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_743036/lang--en/index.htm

16. Board of Innovation. Economic analysis of low-touch economy industries: <https://www.boardofinnovation.com/blog/what-is-the-low-touch-economy/>
17. BusinessInsider. Exxon Mobil Q1 2020 Financial results: <https://markets.businessinsider.com/news/stocks/exxonmobil-q1-earnings-first-loss-decades-oil-market-price-plunge-2020-5-1029155170>
18. Financial Times. BP Financial results: <https://www.ft.com/content/4ba98555-b45d-415b-80ea-a59d8b481f9e>
19. CNBC on Shell's plans on spending cuts and share buyback: <https://www.cnbc.com/2020/03/23/shell-cuts-2020-spending-by-5-billion-and-suspends-share-buyback.html>
20. Reuters. News story on oil supertankers not allowed to port: <https://www.reuters.com/article/us-global-oil-tankers-storage/crude-oil-held-in-sea-storage-hits-new-record-at-160-million-bbbls-sources-idUSKBN21Z2A2>
21. MarineTraffic. Real time monitoring of sea vessels: <https://www.marinetraffic.com/en/ais/home/centerx:4.0/centery:52.0/zoom:9>
22. ICAO. Global impact of pandemic on air traffic (12 May): https://www.icao.int/sustainability/Documents/COVID-19/ICAO_Coronavirus_Econ_Impact.pdf
23. BBC. News story on Airbus: <https://www.bbc.com/news/business-52436741>
24. BBC. News story on Virgin Atlantic bailout: <https://www.bbc.com/news/business-52431290>
25. CNN Business. News story on Lufthansa bailout: <https://edition.cnn.com/2020/05/05/business/lufthansa-bailout-coronavirus/index.html>
26. Euractiv. News story on Air France–KLM bailout: <https://www.euractiv.com/section/aviation/news/air-france-klm-gets-virus-bailout-green-conditions-still-pending/>
27. The Guardian. George Monbio's assessment of airlines and oil companies bailout: <https://www.theguardian.com/commentisfree/2020/apr/29/airlines-oil-giants-government-economy>
28. Investor Agenda. Declaration from institutional investors of May 3, 2020: https://theinvestoragenda.org/wp-content/uploads/2020/05/FINAL-THE-INVESTOR-AGENDA_-A-SUSTAINABLE-RECOVERY-FROM-COVID-19-CLEAN_v1.pdf
29. Oxford Smith School of Enterprise and the Environment. Fiscal recovery package review: <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>
30. The Guardian. News story on New Zealand 2020 budget: <https://www.theguardian.com/world/2020/may/13/a-generation-defining-moment-delivering-new-zealands-pandemic-budget>

Significance of the Deal

31. European commission, presentation of the political programme of the European Commission headed by Ursula von der Leyen: https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_bg_1.pdf

31. Euractiv, information on the Green Deal: <https://euractiv.bg/section/енергетика/news/осное-ни-акценти-от-европейската-зел/>
32. Euractiv, information on the Green Deal: <https://www.euractiv.com/section/circular-economy/news/circular-economy-is-number-one-priority-of-european-green-deal/>
33. EU Observer, preliminary data on the financial distribution in the Green Deal: <https://euobserver.com/environment/147161>
34. The Sega Daily, news story on the meeting of ministers of energy on 28 April: <https://www.segabg.com/node/132633>
35. Croatia's Presidency of the EU, communication about a ministerial meeting: <https://eu2020.hr/Home/OneNews?id=261>
36. Climate Change News, story on the support of European governments for the Green deal as a key mechanism for economic recovery: <https://www.climatechangenews.com/2020/04/20/four-eu-nations-back-green-post-coronavirus-recovery/>
37. Position of For-the-Earth environmental NGO on the establishment of an Advisory board for the Green deal: https://www.zazemiata.org/wp-content/uploads/2020/04/20200403_ZZ_GP_pismo-do-MS_ZelenSavet.pdf

The return of the People to the Economy

47. CE Delft: The potential of energy citizens in the European Union: <https://www.cedelft.eu/publicatie/the-potential-of-energy-citizens-in-the-european-union/1845>
48. Lichtblick, urban solutions for photovoltaic cooperatives: <https://www.lichtblick.de/presse/news/2013/11/28/energiewende-2.0-mit-zuhausestrom-mieter-beziehen-sonnenstrom-direkt-vom-dach/>
49. Example: Solar district heating plant in Gram, Denmark: <https://www.solar-district-heating.eu/dk-monitoring-2/>; <http://www.gram-fjernvarme.dk/>
50. Solar district heating project in Bulgaria. Analysis of technical and economic possibilities for implementation. CREA Association, Institute for Zero Energy Buildings: https://www.solarthermalworld.org/sites/default/files/news/file/2017-01-04/bulgaria_sdh-analysis_2015.pdf
51. The Guardian, overview of Milan's post-COVID-19 plans for pedestrian and bicycle transport: <https://www.theguardian.com/world/2020/apr/21/milan-seeks-to-prevent-post-crisis-return-of-traffic-pollution>

Forgetting the Illusions

39. IRENA. Working paper on stranded assets and RES: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Jul/IRENA_REmap_Stranded_assets_and_renewables_2017.pdf
40. Bulgarian energy holding. Financial reports of energy companies: <https://www.bgenh.com/page/22/Финансови-отчетуи.html>
41. EWRC, Decision-No C-19 of 01.07.2019 for approval of electricity prices: https://www.dker.bg/uploads/reshenia/2019/res_c-19_19.pdf
42. IBEX Monthly report, Market day ahead, March 2020: http://www.ibex.bg/bin/documents/1285_file.pdf
43. EWRC, Application for price approval and cost reconciliation under art. 35 of Energy Act, 31.03.2020: https://www.dker.bg/uploads/zaqvlania_ceni/2020/el/tec_marica_iztok2_20.pdf
44. EWRC, Decision-No C-21 of 11.07.2019: https://www.dker.bg/uploads/reshenia/2019/res_c-21_19.pdf
45. Lazard's Levelized Cost of Energy (LCOE) analysis – Version 13.0, November 2019: <https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf>
46. Mycle Schneider Consulting, World Nuclear Industry Status Report 2019): <https://www.worldnuclearreport.org/IMG/pdf/wnisr2019-v2-lr.pdf>