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SIX REASONS WHY OUR REPORT IS EVEN MORE RELEVANT TODAY

In November last year, CENTERO Research Association published a report titled «**Vida Verde: Reverse Modernization as a New Vector of Inclusive Growth**», produced by an international team of authors and dedicated to the search for alternative ways of organizing modern society. The push to expand industrial production in order to deliver an increasing volume of material goods cannot be sustained without major consequences for the environment. However, the concept of economic growth is still perceived as the sole model of social development on the planet, which generates an entire array of environmental, social and political problems. In fact, it brings us closer to having to make the unsettling choice between maintaining economic growth and preserving human civilization.

The authors of this report set out to explore possible alternatives to socio-ecological development and answer the following questions: are there any feasible ways forward that do not focus on economic development and linear growth? How willing is the post-COVID-19 world to accept such alternatives? What are the strengths and limitations of these alternative models?

A little over a year after its publishing, the report remains just as relevant. The trends and developments of 2021 have shown that the past year has been a transformative one not only in terms of addressing climate issues, but also in terms of engaging in a deeper search for alternative modes of socio-economic development.

And here is why.

COP26

In November 2021, world leaders gathered in Glasgow, Scotland, to work on what could be called the «successor» to the 2015 Paris Agreement.

The Paris Agreement is the most important document in the field of climate change: when it was designed, nearly all countries of the world recognized the problem of climate change and agreed that efforts must be made to solve it.

The issue was that, at the time, the commitments made by the signatory nations to reduce carbon dioxide emissions did not match the goals set at the conference.

In Paris, the world agreed that by the end of the 21st century, global temperatures would increase by no more than by 2°C above pre-industrial levels. The goal of the conference was to undertake a number of measures to limit this growth to 1.5°C, if possible. However, in reality, the rise in global temperatures will exceed the 1.5°C limit in just 12 years, and by the end of the century, the overall increase will be at least 3°C.

The meeting in Glasgow did not result in any breakthroughs, and neither were any decisive solutions to combat climate change presented there. Still, the results of the summit were critical to further implementation of the strategy to reduce carbon dioxide emissions.

Following the meeting, the heads of the G20 nations, which account for 80% of the planet's gross domestic product and 80% of greenhouse gas emissions, reached an agreement to curb global warming to 1.5° C above pre-industrial levels, noting that achieving this goal would require cooperation of all economies.

The Glasgow Pact also contains a commitment to expedite work to eliminate and regulate fossil fuel subsidies; it reaffirms the importance of carrying out the agreement to raise about \$100 billion annually in 2020-2025 to help the most vulnerable countries (an agreement which has not yet been implemented) and to accelerate technology transfer to these countries to facilitate their ecological transition.

Two new agreements were signed at COP26, aimed at reducing the use of coal and gradually limiting the use of fossil fuels, overall.

At the meeting in Glasgow, more than 40 nations agreed to phase out the use of coal power, a fossil fuel that contributes the most to global warming, far outranking oil and gas. Furthermore, 20 countries have pledged to stop funding projects aimed at exploration and development of fossil fuels abroad by the end of 2022 and prioritize the use of renewable energy sources.

The agreement was signed by a number of countries that still rely on coal for energy production. It should be noted, however, that the most coal-dependent countries, such as Australia, India and the United States, did not sign the agreement. China did not sign the Glasgow Agreement, as well. While the Chinese government announced in September last year that it would halt the financing of coal projects abroad, it should be pointed out that the maximum daily coal production in China has reached 11.93 million tons – a record figure (in recent history).

Russia (which was not present at COP26) had its participation limited to a virtual address, and also refused to sign the agreement. In fact, Russia's current Energy Strategy until 2035 calls for an increase in gas production by 50% by 2035; the country's coal mining strategy until 2035 also foresees an increase in coal production.

In addition, about 100 countries signed a global commitment to reduce methane emissions by 30% by 2030, compared to 2020 levels (Russia is not listed among the signatories of this document, as well). Invisible and odorless, methane has 80 times the ability to cause short-term warming than carbon dioxide and is a major greenhouse gas.

In addition to the agreements on methane and coal, another historic document was signed at COP26: the world's indigenous peoples will now receive funding in recognition of their role in protecting forests.

At the climate summit in Glasgow, the UK, Norway, Germany, the US and the Netherlands pledged to allocate money to support indigenous peoples. The new agreement can be considered a historic one, and the indigenous peoples have received the official status as «keepers of the world's forests», finally receiving recognition after years of marginalization. 4

The pledge to support indigenous peoples stands at €1.47 billion (\$1.7 billion) by 2025. The money is planned to be spent on further development of indigenous communities, as well as mapping and registration of property. These measures are to protect local communities from farmers and industrialists encroaching on their land. Previously, representatives of these communities, who do the most to preserve biodiversity of the planet and protect natural habitats, received less than 1% of the funding allocated worldwide to reduce deforestation.

Developed countries invest not only in forest protection, but also in the fight against poverty and the efforts to combat the COVID-19 pandemic (indigenous peoples are some of the most vulnerable social groups: they are much more likely than others to be subject to poverty or die from treatable illnesses). Furthermore, governments will incorporate indigenous peoples' experience of biodiversity conservation and try to «save the planet» in partnership with local communities.

The COP26 agreement could be viewed as a follow-up to the initiative approved at the World Conservation Congress, held in 2020. At that time, the Coordinator of Indigenous Organizations of the Amazon River Basin (COICA), which covers 3.5 million indigenous people from nine countries, presented the 80x25 Initiative (the Green Amazon declaration) – a call to protect 80% of the Amazon Basin by 2025.

All of the above clearly indicates that **indigenous peoples are gaining political capital**, and their views on environmental issues can no longer be dismissed.

DRAMATIC REDUCTION IN EMISSIONS AND DECARBONIZATION

In 2020, the world heard the most important statement made regarding climate change: speaking at the UN General Assembly in September 2020, Chinese President Xi Jinping announced that his country would achieve carbon neutrality by 2060.

Reducing carbon dioxide emissions is expensive. China is considered the world's largest greenhouse gas emitter (about 30% of all emissions on the planet come from China). And now, the world's most polluting country decided to unilaterally reduce its emissions, regardless of whether other countries would follow suit. This dramatically changed the situation around the climate issue. Previously, countries were afraid to take on obligations (and the related costs) to decarbonize their economies, while some nations outright denied the gravity of environmental issues.

Now, China has come to be a de-facto trendsetter in environmental public policy. And it is no longer alone. European nations are also deep in the «green camp».

In 2019, the UK became the first major economy in the world to set a legally binding target to reach net-zero greenhouse gas emissions by 2050. The European Union followed suit in March 2020.

Japan and South Korea also joined the list of over 110 countries that, according to the UN, have set a goal of achieving zero emissions by mid-century. With the election of Joe Biden as President of the United States, the world's largest economy has also decided to cut CO2 emissions.

According to UN data, countries that have pledged to achieve net-zero emissions account for more than 65% of global emissions and over 70% of the world economy.

India is also committed to achieving net-zero carbon emissions by 2070. This was announced by Prime Minister Modi during his speech at the climate summit. Modi promised that, by 2030, his country would produce 50% of its electricity using clean energy sources (up from the previous goal of 40%). He also pledged to reduce the economy's emissions intensity by 45% by 2030 (the previous target was 35%).

Modi reminded that his country decided to step up its commitments despite the fact that developed countries had not fulfilled their promises of financial assistance. India's goal is less ambitious compared to the US and EU's plans to achieve carbon neutrality by 2050, but it is important to consider that a major part of the country's population does not even have access to electricity.

Russia intends to achieve carbon neutrality no later than 2060. According to Russian President Vladimir Putin, forest ecosystems will help Russia achieve this goal, thanks to their role in absorbing carbon dioxide and producing oxygen.

All nations have made different decarbonization commitments, so the contribution to the «green transition» will vary from country to country. However, the very fact that such solidarity has been achieved worldwide with respect to emissions reduction is critical evidence of the urgency of environmental issues.

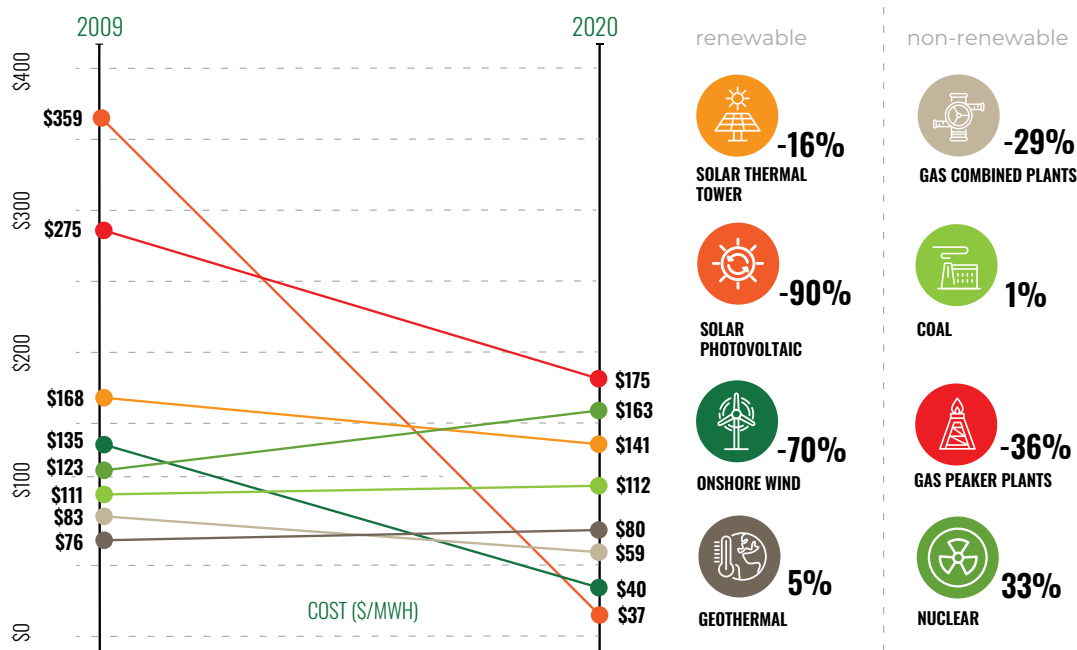
THE FALLING COSTS OF RENEWABLE ENERGY

In October 2020, the International Energy Agency concluded that solar power is the cheapest source of electricity. Most countries agree that, at this point, producing energy from renewable sources is often cheaper compared to energy generated by burning fossil fuels.

If, in the coming years, countries step up investment in wind and solar power as well as battery storage, energy prices are likely to decrease even further – to the point where it becomes profitable to phase out coal and gas-fired power plants, replacing them with renewable energy sources.

This way, an increase in the volume of renewable energy will lead to accelerated global energy transition, while renewable energy sources will become even cheaper, growing more competitive across the globe.

Figure 1. Change in the cost of renewable and non-renewable energy sources¹



¹ Source: www.catorce6.com/actualidad-ambiental/internacional/19253-costo-de-electricidad-de-fuentes-de-energia-renovable-es-ahora-mas-barata-que-nunca-agencia-internacional-de-energia?_cf_chl_jschl_tk_=gtclgYhkXE.9JpN64bJB.qSZ58zf8YXgayzM9meD8xk-1636226223-0-gaNycGzNCL0

«GREEN» TRENDS IN PUBLIC POLICY

To this day, the COVID-19 pandemic continues to impact the global economy and affect social and environmental developments. The virus has caused the worst economic shock since the Great Depression in the 1930s. Responding to it, the governments of the world started to take measures to stimulate the economy, which made **some of the «green» trends in public policy more pronounced.**

The EU carries out an economic development strategy known as the European Green Deal, which aims to make Europe the first climate-neutral continent by 2050. With that goal in mind, the European Commission started implementing the plan to protect the environment and create a clean economy with net-zero greenhouse gas emissions. Achieving this will improve people's well-being and make companies more sustainable, establishing Europe as the global leader in climate action.

The European Green Deal plan sets the target of reducing emissions by at least 55% by 2030. The European Parliament went even further, raising the target for the current decade to 60% (compared to 1990 emissions data).

The Green Deal's roadmap for sustainable development includes 50 steps aimed at improving the efficiency of resource use. These steps cover all sectors of the economy, but focus on those that continue to generate the most emissions: transport, energy, and industry.

Developing countries are also actively introducing «green» projects as part of their public policy objectives. For example, as a result of Ecuador's Socio Bosque program, which is designed to improve socio-ecological mechanisms aimed at strengthening financial resilience, building a green economy and using the Buen Vivir concept as a new model for equitable and balanced development, 1,670,000 hectares of forest were preserved in 2020.

In Mexico, President Andrés Manuel López Obrador presented the Sembrando Vida environmental project which tackles the

problems of soil degradation and deforestation. The government makes payments to farmers as part of the campaign to plant 3.4 million new trees. According to the Mexican authorities, this initiative will not only help combat deforestation, but also contribute to food security, as most of the newly planted trees are fruit trees.

Among the programs and initiatives for environmental conservation and sustainable development, Mexico's Escazú Agreement ratified in 2021 is especially noteworthy. This is the first agreement in Latin America and the Caribbean that guarantees access to public participation, information and justice in environmental matters¹. Latin America is currently the region with the highest number of environmental activists murdered. This is why the ratification of the Escazú Agreement (which was also ratified by Ecuador) indicates an understanding of the importance of environmental issues and empowers citizens to protect the environment.

By introducing programs and initiatives aimed at protecting the environment, both developed and developing nations primarily focus on preventing economic growth from being dependent on the use of nonrenewable natural resources. This is achieved through sustainable management of ecosystems and the search for alternative solutions.

For example, the European Union and president Biden's new administration have pledged trillions of dollars in «green» investment to boost their economies and launch the decarbonization process. If other countries join the EU and the US in this effort, it will allow to cut the costs of renewable energy around the globe.

However, according to the UN, there are developed economies that still spend 50% more on the fossil fuel sector than on low-carbon energy. Therefore, the proponents of decarbonization will require not only the «carrot» in the form of cheap energy, but also the «stick» in the form of protective tariffs against major GHG-emitting economies.

In 2019, Russia became a full member of the Paris Agreement, which signaled a change in the attitude of the Russian authorities toward the issue of climate change. Russia is among the world's largest emitters of greenhouse gases², and

¹ México ratifica el acuerdo de Escazú que entrará en vigor 22 de abril. URL: www.efe.com/efe/america/mexico/mexico-ratifica-el-acuerdo-de-escazu-que-entrara-en-vigor-22-abril/50000545-4447235
² Russia's Climate Agenda: Responding to International Challenges. CSR, Moscow, 2021. P. 17. URL: www.dipacademy.ru/documents/2267/2021.1.%D0%94%D0%BE%D0%BA%D0%BB%D0%B0%D0%B4_%D0%9A%D0%BB%D0%B8%D0%BC%D0%B0%D1%82_%D0%A6%D0%A1%D0%A0_%D0%90%D0%A6_%D0%A0%D0%AD%D0%99_%D0%A1%D0%A6.pdf

this causes increased attention to its environmental public policy from the international community.

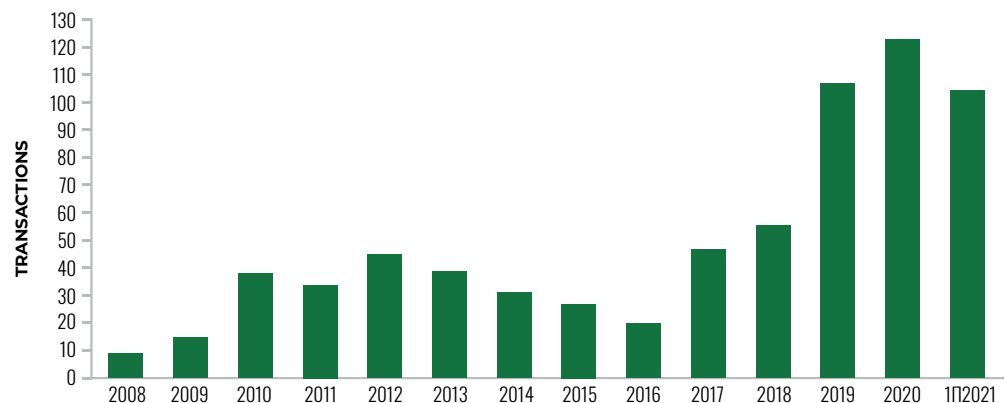
Commitments under the Paris Agreement will require a radical restructuring of the Russian economy, as the energy sector accounts for a significant share of emissions. This is why Russian authorities have already approved a modernization program for thermal power plants, impacting nearly 40 GW¹ of energy production, and why the Russian legislature is considering a draft proposal on state regulation of greenhouse gas emissions. The bill includes such ideas as creating a system of carbon accounting, introducing payments for CO₂ emissions in excess of the fixed rate, as well as a system of tradable carbon quotas. As part of its obligations under the Paris Agreement, Russia undertakes to reduce the volume of greenhouse gas emissions by 25-30% by 2030 (compared to the 1990 baseline). So far, this obligation has been fulfilled.

¹ The Russian Government Approves Program for Modernization of Thermal Power Plants.
www.minenergo.gov.ru/node/13784

«BUSINESSES TURNING GREEN»

According to Ernst & Young, the market for transactions across the entire hydrogen value chain has seen a noticeable resurgence in recent years (see Figure 2). In fact, despite the current crisis, in 2020, 15% more hydrogen-related transactions were announced and completed globally, compared to 2019. In the first half of 2021, this trend has grown even stronger: compared to the same period last year, the number of transactions almost doubled.

Figure 2. The Russian Government Approves Program for Modernization of Thermal Power Plants¹



Clearly, the declining cost of renewable energy and growing public pressure for climate action are changing attitudes to the energy business. Investors are no longer as eager to invest in new oil wells and coal-fired power plants, since such assets are now considered a financial risk.

This logic manifests itself across the markets. This year alone, Tesla's skyrocketing share prices have made it the most valuable car company in the world, with its market capitalization reaching \$1 trillion. Meanwhile, the stock price of Exxon, once the most valuable company in the world, has fallen so much that it has been delisted from the Dow Jones Industrial Average index.

At the same time, **there is a growing pressure to force companies to take climate risks into account when making financial decisions.**

Hydrogen projects are of particular interest, as it's an area that draws investment not only from businesses, but also from the state. For example, Argentina's President Alberto Fernandez announced a «historic investment» in the production of clean hydrogen in Patagonia, while Spain's largest oil and gas company Repsol decided to double its commitment to hydrogen energy by investing 2.5 billion euros until 2030. The company intends to reach 1.9 GW of energy generation in the next decade – nearly 60% more than was envisioned in the previous strategy. Through this boosting of investment in «green hydrogen» production, Repsol aims to become the third-largest hydrogen producer in Europe. The company emphasized that green hydrogen is “one of the pillars” of its decarbonization strategy.

GREEN HYDROGEN – THE NEW BLACK OF GLOBAL ENERGY

While it may seem quite novel, hydrogen energy has deep roots. In fact, the first hydrogen fuel cell was developed by the British inventor William Robert Grove back in 1839. Since then, hydrogen power has advanced greatly, with fuel cells being used in NASA spacecraft and US Navy submarines. Since the late 1990s, more and more hydrogen buses and cars have made to the roads every year, and some countries are developing an infrastructure of hydrogen fueling stations and hydrogen-powered trains.

Until recently, however, the use of this technology remained quite limited; hydrogen power accounted for only a fraction of a percent of global energy production. What was the reason for that?

While the technology itself was available, the cost of using it was prohibitive. The high costs, in turn, were due to the insufficient level of development of the technology – it could not be brought to the mass market, which kept the demand for this type of fuel relatively low. Until recently, the world was dominated by oil, gas and nuclear energy, leaving almost no room for hydrogen. Individual projects undertaken by a number of countries and companies were experimental in nature, and scaling up hydrogen energy production wasn't considered viable at the time.

However, the events of 2020–2021 have altered energy trends in a significant way. Most of the developed world has embarked on a course toward carbon neutrality, and to achieve that these countries will need to greatly expand their renewable energy capacities – including hydrogen.

An industry which until recently had been fairly obscure now gained attention from major corporations and governments.

Attention turned into projects, deals, and growing investment in hydrogen energy. In this sense, 2021 became a turning point: companies and states moved from declarations to adopting strategies, signing contracts, and developing strategic policies for hydrogen use.

The following trends deserve a special emphasis:

1. Hydrogen is increasingly becoming the topic of intergovernmental negotiations and agreements at the highest level. Cooperation takes place both between traditional partners (Russia and Germany) and between countries that did not previously engage in major energy projects together (South Korea and Chile, Germany and Australia).
2. The use of hydrogen as an energy source is evolving across several major tracks, including:
 - transport (aviation, automobiles, trains);
 - power generation for residential and industrial needs.
3. Most energy corporations that have built their operations around the production and processing of oil and gas view hydrogen as one of the ways to maintain their market share (Gazprom, Chevron, Shell, Equinor, etc.).
4. Hydrogen has not yet gained widespread appeal among car owners. However, a significant number of car manufacturers have either already launched hydrogen-powered models or are in the process of developing them. Hyundai and Toyota currently hold leading positions in the automotive industry in terms of hydrogen use. <https://timesofindia.indiatimes.com/auto/cars/hyundai-ranked-first-in-hydrogen-cars-sales-surpasses-toyota/articleshow/84999377.cms> It is very likely that, as the technology becomes cheaper and the relevant infrastructure is established, mass demand for hydrogen cars will go up.
5. A significant share of hydrogen projects and initiatives across the globe is carried out either directly by the state or with its support (subsidies, tax incentives, etc.). As the technology is not yet mature enough and market efficiency is low at the moment, state involvement can be one of the key factors in the successful deployment of hydrogen in any given country.
6. Despite the previous experience of climate skepticism, the Russian government is trying to keep up with hydrogen

policy trends and is taking active steps to develop its own hydrogen sector. A roadmap for hydrogen development has been approved, and there are ongoing discussions about the possibility of launching hydrogen energy facilities in various regions of Russia: Sakhalin, Kamchatka, Karelia, and elsewhere. In addition, there are plans to gradually deploy hydrogen-powered public transport in Moscow. The experience can later be replicated in other parts of the country.

At the same time, like any other renewable energy source, hydrogen threatens the status of the existing hydrocarbon resources within the economies of the world. For Russia, as for numerous other exporters of energy resources, the issue of hydrogen has to do not only with the issue of climate change, but also with the geopolitical challenge of retaining its share of the global energy market. As a result, there are attempts at integrating hydrogen energy into existing socio-economic models (e.g., using the Nord Stream gas pipeline to pump hydrogen). Time will tell whether these initiatives are viable or not.

The year 2021 has demonstrated how profoundly political decisions can affect socio-economic developments. The course toward decarbonization has led to an upsurge of interest in hydrogen, large-scale investments, and new scientific research. All of these are likely to strengthen the hydrogen industry among other renewable energy sources and establish it as one of the pillars of the economies of the future.

CONCLUSIONS

1 The events of 2021 showed that this year was a turning point not only in terms of addressing climate issues, but also in terms of a deeper search for alternative models of socio-economic development. This is confirmed to some extent by the outcome of the COP26 summit, where the global community took its first step toward a post-extractivist economy.

2 Most states are committing to decarbonization to the extent they can. Many countries have expressed their intention to reduce carbon emissions, but few have already executed or, in fact, even started to execute strategies to achieve these goals. There is reason to suspect that, instead of engaging in a genuine ecological transition, a number of countries are merely paying lip service to the cause, trying to appear as upstanding members of the international community.

3 Businesses are very much aware of the current environmental agenda and sense the growing pressure from the public, which is why they have been introducing «green strategies» and using innovative solutions to minimize damage to the environment.

4 In 2021, serious discussions have begun about the possibility of phasing out fossil fuels in favor of hydrogen. It should be admitted, however, that due to the high cost of hydrogen production, the position of fossil fuels in the global economy remains strong.

5 Despite overall positive developments, a number of think-tanks say that in 2021, global CO₂ emissions from burning fossil fuels will return to pre-crisis levels, and in 2022, emissions are projected to rise even more, as road transportation and aviation recover from travel restrictions imposed during the pandemic. This year, CO₂ emissions are expected to reach 36.4 billion tons, which is 4.9% higher than in 2020. The world, therefore, needs a conceptual framework on how to reduce emissions «here and now». In order to achieve positive progress, it is not enough to make «pragmatic» decisions – one should also consider more comprehensive «recipes», such as searching for a vision that would restore the world's ethical foundations and foster respect for the environment.

Vida Verde is a project of the CENTERO Research Association
on the “green” and ESG Agenda.

Telegram-channel: t.me/centerok

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