



lifted on Iran, it is not yet clear what influence that might have on Tehran's position, though it is likely that Iran, which now has become a competitor, will continue to oppose the construction of any trans-Caspian pipeline.

Multidimensional aspects of a legal framework in terms of theoretical and practical basis require the political will of the key players for a consensus. As Vladimir Putin stated in 2002, the future of the Caspian – whether it is a sea of cooperation or a clash of interests – will depend on how the littoral states untangle the tight Caspian knot of problems. Although some argue that a five-way treaty currently seems highly unlikely, there is still hope.

The general consensus so far is that the seabed (and the oil and gas resources underneath) should be divided into national sectors and the sea's surface and water layer should be shared. But how this division may be accomplished still remains a challenge.

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<sup>1</sup> Up to now, the summits have been held in Ashgabat in 2002, Tehran in 2007, Baku in 2010 and Astrakhan in 2014. The next one is planned to be held this summer in Astana.

<sup>2</sup> Adopted agreements so far cover the conservation and sustainable use of marine biological resources of the Caspian Sea, cooperation in the field of prevention and liquidation of emergency situations in the Caspian Sea, and cooperation in the field of hydrometeorology of the Caspian Sea.

<sup>3</sup> Following the bilateral treaties they concluded in the second half the 1990s, Russia, Kazakhstan and Azerbaijan signed in May 2003, a tripartite agreement dividing the northern 64% of the Caspian Sea seabed and subsoil into three unequal parts, and left the waters of the Caspian open to shared use for maritime commerce and fishing. Kazakhstan obtained 27%, Russia 19%, and Azerbaijan 18%. Iran rejects the suggested share of 14% but lays claim to 20%, transferring the boundary 80 km north of the line along which

the Iran-Soviet maritime boundary was drawn.

<sup>4</sup> For instance, Azerbaijan mentions its oil exploitation in the Caspian Sea since 1956 as a customary practice. But how can a newly independent state perform customary practice and yet not be a successor state?

<sup>5</sup> This imaginary line connects the Astara village (in Azerbaijan) on the western shore with the Hasankuli village (in Turkmenistan) on the eastern shore.

<sup>6</sup> Azeri and Chirag fields are called respectively Hazar (Omar) and Osman in Turkmenistan.

<sup>7</sup> Yolbars A. Kepbanov, "The New Legal Status of the Caspian Sea is the Basis of Regional Cooperation and Stability", *Perceptions*, Volume II - Number 4, December 1997-February 1998.

<sup>8</sup> Mineable reserves of Kapaz field are assessed at over 350 million barrels of oil.

<sup>9</sup> The field actually consists of three fields: Sharg, Alov and Araz.

<sup>10</sup> The field is estimated to hold 2.6 billion barrels of oil and 2.4 billion cubic meters of gas.

<sup>11</sup> Natural Gas Europe, "Iran, Azerbaijan Discuss Joint Caspian Projects", 24 February 2016. Available at <http://www.naturalgaseurope.com/iran-azerbaijan-discuss-joint-caspian-projects-28328>

<sup>12</sup> The Ashgabat Declaration, which provides a foundation for the practical implementation of the project, launched the work of the intergovernmental committee.

"Political disagreements among the players are inevitable in the region and will surface once their interests and priorities clash. Unless military security in the Caspian basin is ensured, Iran and Russia will delay by any means the process of the resolution of the legal framework."



## PROSPECTS FOR RENEWABLE ENERGY IN TURKEY AFTER PARIS COP21 SUMMIT

by Serhat S. Çubukçuoğlu

### OVERVIEW OF COP21 SUMMIT'S IMPLICATIONS

“Ten years after its inauguration, Turkey ratified only the Annex-I of the UNFCCC in 2004 and is therefore exempted from the obligation to undertake GHG emissions reduction commitments.”

“Research reveals that 71% of CO2 emissions in Turkey are caused by the industry and coal-based power plants that contribute to 29% of electricity generation.”

Turkey is a developed OECD country in the league of G-20 with close to 4% projected GDP growth rate per annum in 2016-17.<sup>1</sup> Global warming due to greenhouse gas (GHG) emissions constitute a common problem of mankind and draws attention from countries at the top of the industrial league to emerging ones alike, and Turkey is no exception to this. Since 1994, UNFCCC<sup>2</sup> treaty obliges adopting parties to reduce the impact of global warming caused by human activities through “common but differentiated responsibilities.” Ten years after its inauguration, Turkey ratified only the Annex-I of the UNFCCC in 2004 and is therefore exempted from the obligation to undertake GHG emissions reduction commitments.<sup>3</sup> Likewise, after tense negotiations and only then in 2009 following the third conference of the parties (COP3), Turkey became a signatory to Kyoto Protocol, but limited its responsibility to Annex I of the UNFCCC without introducing new commitments.

Research reveals that 71% of CO2 emissions in Turkey are caused by the industry and coal-based power plants<sup>4</sup> that contribute to 29% of electricity generation. On the global scale, well-established scientific evidence shows that the world's human-induced GHG emissions, of which CO2 makes up 80%,<sup>5</sup> that cause an enhanced greenhouse effect come from combustion of fossil fuels. These facts provide invaluable forecast about risks and courses of possible action to insure against them. By looking at current trends, it is not difficult to estimate that production of conventional oil & gas will peak and decline in the 21st century. Economic growth, pros-

perity, and better lives will be made possible with low carbon-footprint.

The UNFCCC COP21 summit in 2016, held in Paris, set a cornerstone in global energy revolution as for the first time, it brought 175 countries into a common cause to curb net CO2 emissions and limit global temperature rise to 2°C, however optimistic this target may still seem to be. Adoption of renewable and clean energy technologies plays a key role to implement this action plan. From that perspective, Turkey's active participation and contribution to gradually phase out coal and fuel power to replace them with solar, wind, geothermal, and hydro power will help preserve the environment for our future generations and for the world as a whole. As a growing economy, Turkey has demonstrated significant progress in its efforts to combat climate change through sustainable development principle, which is to “meet the needs of the present without compromising the ability of future generations to meet their own needs”.<sup>6</sup> Turkey should continue to foster environmentally friendly, innovative policies to decarbonize energy through market liberalization, public-private partnerships, technology transfer, carbon taxation, and financial assistance for green investments. With Paris accord, Turkey has declared to commit up to 21% further reduction in carbon emissions rate from its current levels by 2030.<sup>7</sup> It is crucial to emphasize that Paris COP21 is a non-binding treaty and intended national contributions are determined solely by each participating country on a voluntary basis. It is expected that the treaty will be ratified by signatories and enter into force within the next year.

### RENEWABLE ENERGY POLI-



## CY IN TURKEY

Turkey still has abundant potential to increase efficiency in energy production, distribution, and consumption.<sup>8</sup> Therefore, it is imperative to adopt solutions that address energy supply and demand inefficiencies in order to reduce carbon emissions. From an economic perspective, the impact of further market liberalisation and higher efficiency would be to reduce import bills and wasteful fuel subsidies, thus contributing to GDP growth. The responsibility to adopt renewable energy also lays with the private sector, which has been encouraged and incentivised by the government to invest and participate in power generation. Yet, there is more work to be done to update the legislation, further develop the transmission infrastructure, and increase investor awareness to attract potential suppliers.<sup>9</sup>

There has been an unprecedented decline in global oil investments in two consecutive years, and lower oil prices will remain as a reality for years to come.<sup>10</sup> The forecast for crude oil price this year is that it will hover around \$45-\$52 band.<sup>11</sup> However, this temporary situation should not preclude policy makers from adopting long-term measures to reduce reliance on fossil fuels. Turkey is a net importer of energy, with a gaping current account deficit at 4.5% of GDP in 2016,<sup>12</sup> part of which, despite substantial improvement since 2014, is due to price of fuel imports and has been exacerbated by the turmoil within Turkey's neighborhood. Access to cheaper, cleaner, and more sustainable energy supply would help Turkey to ease its current account deficit and help to realize its vision for the centennial anniversary in 2023. Turkey should maintain a disincentive through carbon taxation against consumption of oil by private entities. Taxation is a better, non-distorting, and transparent way to reduce emissions than policies such as subsidies or mandates for renewable energy.<sup>13</sup> To the extent that renewable energy replaces carbon-intensive fuels, Turkey can further diversify its energy supplies and con-

tribute to the mitigation of urban pollution and CO<sub>2</sub> emissions.<sup>14</sup>

According to IEA,<sup>15</sup> 46% of global CO<sub>2</sub> emissions resulted from coal as of 2013,<sup>16</sup> and in order to meet COP21 criteria 80% of coal reserves must remain untouched. Although coal has been replaced by shale gas using fracking technologies in the US, for instance, 40% of electricity generation worldwide still comes from coal,<sup>17</sup> the usage of which is high especially in emerging countries like India and China. In a similar fashion, Turkey planned to construct 86 new coal-fired power stations as of 2013<sup>18</sup> that can increase coal-based GHG emissions by 60% until 2030, ranking Turkey as the fourth largest polluter in the G-20 league.<sup>19</sup> According to sector players, the government reintroduced a number of incentives and exemptions from environmental regulations until 2020 for privatized coal-fired power plants.<sup>20</sup> These plants threaten the achievement of already inadequate targets and suggest that emissions from coal could more than double.<sup>21</sup> Although the intention behind building coal-fired plants is to reduce import dependency, especially on natural gas, Turkey readily imports 32%<sup>22</sup> of its total coal consumption and is dependent on hard-coal imports to meet 90% of this demand, which in fact presents a policy inconsistency.<sup>23</sup> Also, majority of lignite coal reserves in Turkey are of low quality and unsuitable for enrichment, which render these unfit for investment for electricity generation.<sup>24</sup>

Turkey's EPDK<sup>25</sup> should no longer grant licenses to coal-fired plants; at least it should ban construction of inefficient plants. To incentivize coal power generation while the World Bank and EIDB<sup>26</sup> limit project finance is against the spirit of the COP21. Even Chinese investors, now that their own economy has slowed, do not pay great interest in such projects any more. Subsidized coal-power plants create overcapacity, inefficiency, and perpetuate imported energy. Turkish Ministry of Energy should engage well-financed private sector actors such as

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“The cost of solar power is now cheaper by 80%, and wind power by 30%. IEA estimates that 60% of energy investments globally in the next 25 years will be on renewable energy sources.”

“Research reveals that each unit of electricity produced by solar power creates eight times higher employment than coal and natural gas, and seven times more than nuclear power, which are interesting facts to note especially in the wake of recent bilateral discussions between Turkey and Russia about reviving Turkish Stream and Akkuyu Nuclear Plant projects.”

TUSIAD<sup>27</sup> to develop sustainability practices and technologies that enable energy innovation to install larger, more efficient plants. Special attention should be devoted to SMEs that represent 46% of Turkish industry energy consumption and require mid-to-long term financing, such as European-funded Climate Turkey program or the World Bank’s Green Bond funding, to raise awareness, subsidize renewable energy projects<sup>28</sup> and address climate risk. With the 2023<sup>29</sup> vision, Turkey should aim to increase the rate of total electricity supply capacity from renewable energy sources to 30%.<sup>30</sup> Although Turkey ranks in the top three among South and Central Asian states for installed hydropower capacity,<sup>31</sup> much of its potential capacity remains unutilized. By 2023, the government should provide technical advice and assistance needed by the private sector to respond to the priorities of reducing GHGs while polluting industries such as Cement Producers Association<sup>32</sup> should incorporate carbon pollution costs into their long-term financial planning. This, in turn, requires assigning a quantitative value to carbon and transparency on its use.

## RENEWABLE ENERGY TECHNOLOGIES IN TURKEY

Technology diffusion is apace at an unprecedented rate. Globalization helped to accelerate adoption of renewable energy technologies unlike before compared to just five years ago. The cost of solar power is now cheaper by 80%, and wind power by 30%.<sup>33</sup> IEA estimates that 60% of energy investments globally in the next 25 years will be on renewable energy sources. Even the oil-rich Emirate of Abu Dhabi in the UAE demonstrated at a recent climate change meeting that it is economically, environmentally and socially beneficial to invest in clean energy and other carbon mitigation strategies.<sup>34</sup> Decentralized power provision for areas without access to electricity grid and measures to prevent price hikes for consumer protection are sine qua non for a sustainable energy policy. G20 Energy Ministers recognized at a recent summit in 2016 the need to drive down technolo-

gy costs to support diffusion, enable policy frameworks and power system integration, and mobilize finance in order to triple the deployment level of renewable energy by 2030.<sup>35</sup>

Research reveals that each unit of electricity produced by solar power creates eight times higher employment than coal and natural gas, and seven times more than nuclear power,<sup>36</sup> which are interesting facts to note especially in the wake of recent bilateral discussions between Turkey and Russia about reviving Turkish Stream and Akkuyu Nuclear Plant projects. On the other hand, Turkey’s largest solar power plant has opened in 2016 in the province of Konya to meet the electricity demand of more than 20,000 households and help prevent an average of 18,000 tons of CO<sub>2</sub> emissions every year.<sup>37</sup> The Mediterranean basin, including Turkey, is fortunate to receive significant amount of solar light convertible into electric power. Turkey has the second largest sunshine duration (7.5 hours per day) in Europe after Spain.<sup>38</sup> The main incentive for investors to solar energy in Turkey are feed-in tariffs, whereas other types of energy generation facilities such as wind, hydro, and biomass may be also subject to purchase guarantees, connection priorities, and license exemptions.<sup>39</sup> Despite high upfront costs, if by 2023 Turkey reaches 20,000 MW of installed wind power capacity by revising its investment and licensing model, this would reduce its natural gas bill by around US\$ 3 billion annually.<sup>40</sup> Moreover, Turkey is ranked 7th in the world in terms of geothermal energy potential<sup>41</sup> and is a founding member of IRENA.<sup>42</sup> Also, the energy stock exchange of Turkey, established in 2015,<sup>43</sup> is set to enhance market liberalization, increase the sector’s competitiveness, and facilitate emissions/carbon trade.

From a more conventional perspective, IAOGP<sup>44</sup> suggests that greater use of natural gas is essential in reducing GHG emissions and providing the backup power, on which wind turbines rely,<sup>45</sup> which should be preferable over coal power. Nevertheless, to improve coal combustion efficiency in min-





imizing GHG emissions, the World Coal Association also supports the G8 / G20 target of 20 industrial scale carbon capture and storage projects operating by 2020. Since this is a costly measure, financing for official development assistance and private sector investment in developing countries like Turkey that extensively burn coal is consistent with international climate protection goals and will require creating investment opportunities.<sup>46</sup>

Despite improvements in sustainable development, it is important to highlight that Turkey is still not a forerunner in global efforts to tackle climate change, nor has it made any legally binding commitment to reduce GHG emissions from its current levels at COP21. Developed countries such as the EU and the US have maintained leadership in setting mitigation goals to reduce CO2 emissions by varying degrees up to 40% compared to 1990 levels by 2030.<sup>47</sup> Some developing countries like Mexico, Morocco, Kenya, and Ethiopia formulated metrics to describe a fair contribution, such as projected emissions per capita.<sup>48</sup>

Part of the challenge is to find possible ways to de-couple economic growth from rising carbon emissions. Turkey, rightly to a certain extent, argues that addressing the environment reduces its development space, and that developed countries have less right to claim protected environmental space that might be needed for development.<sup>49</sup> Green goods trade facilitation, carbon storage, taxation, and trade are among mitigation options suggested by climate scientists, but even if Turkey meets its 21% reduction commitment by 2030, the per capita emission will still be higher than developing countries such as China, Mexico, South Africa, and South Korea. Moreover, higher carbon footprint might implicate indirect export barriers in the form of tariffs from lower footprint countries.<sup>50</sup> According to EBRD, Turkey must increase its non-hydro renewables output about sevenfold by 2023 in order to meet its objective of 30% renewable-generated power.<sup>51</sup>

## CONCLUSION

In overall, if Turkey takes the right steps, it has a substantial potential to undertake renewable energy revolution, realize its vision to become an energy trade hub in an important geostrategic location, fuel its economic growth and enhance energy supply security. Turkey's gradual shift to renewables in its energy mix should be sustained through usage of domestic resources more likely utilizing wind and solar power instead of coal, incentives for the private sector, and better financing mechanisms to facilitate green investments.

Diversification of supply sources especially with a focus on local renewables would cement robust economic development while, at the same time, large scale projects would undoubtedly bring economies of scale in procurement, installation, hence driving down costs and increasing efficiency. In an era of low energy prices where pressures are high to undertake cost-cutting measures and scrap extravagant projects throughout the Middle East, it is crucial to take advantage of local resources, increase infrastructure capacity, and competitiveness. These coupled with Turkey's strategic location at the cross-roads between major producers of the Middle East and demand centers of Europe, make it an ideal target of energy import and export project proposals as well as a potential energy transit hub. With a more liberal market, renewables trade, and emission reductions efforts, Turkey has all the potential to put itself on the map as an ever more important player in energy geopolitics.

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