IRENA at 10: Post Paris Transitions and Energy Diplomacy Beyond OPEC, the Energy Charter Treaty, and the Coronavirus

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> *We now have an opportunity to move away from energy geopolitics characterised by scarcity and conflict. We can enter an energy age built on abundance and peace. To achieve this, international cooperation in particular can help us maximise the benefits and mitigate the challenges arising from the global energy transformation.*
>
> – Adnan Z. Amin, IRENA Director General Emeritus[1]

> We have not just sat back and complained about the negative effects of climate change. Instead we have shown leadership by analysing the challenges, and working out ways whereby we can use those challenges to our advantage.
>
> – Prime Minister Henry Puna, Cook Islands[2]

INTRODUCTION

The International Renewable Energy Agency (IRENA) is the world's most important institution that you have never heard of. More than 180 countries are actively engaged with IRENA to promote the growth of all types of green energy and to maximize the expansion of renewable technologies.[3] IRENA has quietly worked to eliminate barriers to entry for Global South nations into renewable energy markets through advanced research, development, and deployment. This fledgling institution, which emerged as a brainchild of Global South energy architects in the Middle East, Africa, Asia Major, and Small Island States, has worked to democratize power production to enhance development outcomes. IRENA is silently toppling existing paradigms of what is possible in renewable energy outcomes. The IRENA stage provides a platform for ideas and the next generation of energy diplomacy—to rapidly build a future for renewable energy, to make the improbable . . . possible.

The desert winds from Abu Dhabi, which headquarters IRENA, are replacing the old guard of Middle East drillers with a fresh, new vanguard of policymakers, renewable energy technology experts, and finance mechanisms to build a world beyond hydrocarbon extraction. Villages in Tanzania, where 80 percent of the population had no reliable access to energy, are

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1. Adnan Z. Amin, *Remarks by Mr. Adnan Z. Amin at the 9th Session of the IRENA Assembly The Geopolitics of Energy Transformation*, https://www.irena.org/-/media/Files/IRENA/Agency/Speech/20190112-The-Geopolitics-of-Energy-Transformation.pdf [https://perma.cc/UJY7-8Z4C].

2. *Cook Island shows the way in renewable energy*, COOK ISLAND NEWS (Jan. 17, 2017), http://www.cookislandsnews.com/item/62501-cook-islands-shows-the-way-in-renewable-energy/62501-cook-islands-shows-the-way-in-renewable-energy [https://perma.cc/6DM7-HXF8].

3. *About IRENA*, IRENA, https://www.irena.org/aboutirena [https://perma.cc/9SC4-GHF6].

shifting from no electricity to off-grid solar and thereby transforming their social, economic, and development outcomes.[4] The same parts of the world which had neither landline telephones nor electricity from powerlines are joining the global economy with mobile phones and off-grid solar—overnight. In the process of renewable energy's astonishingly rapid deployment, the balance of power of both energy policy and economic growth is moving. The desert sands which saw the oil and natural gas boom are taking a peek at the transformative potential of advanced renewables.

IRENA's Annual Assembly meets in mid-January prior to the start of Abu Dhabi Sustainability Week, which is the largest gathering of sustainability in the Middle East.[5] Abu Dhabi Sustainability Week is not only about having a convention for energy wonks and plutocrats, but a way to converge and inspire new ideas and further innovation for everyone—rich and poor as well as young and old. In 2019, 38,000 people attended Abu Dhabi Sustainability Week events, which had 850 different exhibiting companies, 170 counties represented, and $10.5 billion in deals announced.[6]

Singer and rapper Akon, who was the founder of Akon Lighting Africa Initiative was a guest at a recent Student Exclusive session.[7] He spoke to youth in the region remotely and at the convention about ways to turn passion into action, sharing his journey from a musician to a renewable energy leader. Akon and his partners in the Akon Lighting Africa Initiative said that attending the Abu Dhabi Sustainability Week was essential to build partnerships to aid in providing sustainable energy for Africa.[8] "The urgency of delivering sustainable energy access to the 600 million Africans with no electricity access is the message we took to the Paris

4. *Africa Embraces an $8 Billion Solar Market for Going Off-Grid*, OZY (Feb. 4, 2019), https://www.ozy.com/fast-forward/africa-embraces-an-8-billion-solar-market-for- going-off-grid/92303/ [https://perma.cc/E86V-KXUU].

5. *The Week*, ABU DHABI SUSTAINABILITY WEEK, https://abudhabisustainabilityweek.com/en/the-week [https://perma.cc/DES6-BA9W].

6. *Need to Know: Top 10 Facts About Abu Dhabi Sustainability Week*, ABU DHABI SUSTAINABILITY WEEK (Dec. 12, 2019), https://abudhabisustainabilityweek.com/en/media-center/expert-insights/top-10-facts-about-abu-dhabi-sustainability-week [https://perma.cc/2RBE-UY7R].

7. *Akon and Partners Taking Their Electricity Initiative to Abu Dhabi Sustainability Week*, SOWETAN LIVE (Jan. 14, 2016), https://www.sowetanlive.co.za/news/2016-01-14-akon-and-partners-taking-their-electricity-initiative-to-abu-dhabi-sustainability-week/ [https://perma.cc/MD32-FYND].

8. *Id*.

Climate Change conference in December [2015]," said Akon.[9] He added, "We see ADSW—the first global gathering on sustainability since COP 21—as a great opportunity to transition the historic agreement reached at Paris into action to deliver a brighter future for Africa."[10] For perspective, the Akon Lighting Africa Initiative had installed 100,000 solar street lamps in 480 communities across 15 countries as well as 1,200 solar micro-grids and created 5,500 indirect jobs—providing electricity to 1 million people, who would not otherwise have it.[11] Without electricity, there is no development. Without development, there is no poverty alleviation. Even then, all this change for renewable energy cannot come fast enough. Volatility in oil markets due the coronavirus pandemic makes the transition to renewables more urgent by the day.

The United Nations reports that the catastrophic results of climate change cannot be averted at this point.[12] By mid-century, millions will die in Asia and Africa from climate change-induced events.[13] Global climate change and related weather catastrophes have increased environmental, economic, and social losses.[14] A new wave of activism was on display

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9. *Id*.

10. *Id*.

11. Zack O'Malley Greenburg, *Inside Akon's Plan To Remake Africa—And Make Money Along The Way*, FORBES, https://www.forbes.com/sites/zackomalleygreenburg/2016/05/24/inside-akons-plan-to-remake-africa-and-make-money-along-the-way/#6ef5fdf37ab0 [https://perma.cc/A394-E46U].

12. *Global Warming of 1.5°C*, 9 (Oct. 2018), INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf [https://perma.cc/WZ8K-5R4R]. "By 2100, global mean sea level rise is projected to be around 0.1 meter lower with global warming of 1.5°C compared to 2°C (medium confidence). Sea level will continue to rise well beyond 2100 (high confidence), and the magnitude and rate of this rise depend on future emission pathways. A slower rate of sea level rise enables greater opportunities for adaptation in the human and ecological systems of small islands, low-lying coastal areas and deltas (medium confidence)." *Id.*

13. KRISTIE L. EBI, JEREMY J. HESS, & PAUL WATKISS, HEALTH RISKS AND COSTS OF CLIMATE VARIABILITY AND CHANGE IN INJURY PREVENTION AND ENVIRONMENTAL HEALTH (Mock CN ed., 2017), https://www.ncbi.nlm.nih.gov/books/NBK525226/ [https://perma.cc/8MD3-8Y9F].

> By 2060, the largest negative effects were projected to take place in Africa and the Middle East (–0.6 percent for South Africa, −0.5 percent for the Middle East and North Africa, and −0.4 percent for other African countries). Smaller impacts were projected for Brazil, Mexico, and LMICs in Asia (−0.3 percent), as well as for Indonesia, the United States, South-East Asia, and most of Latin America (−0.2 percent). Some regions were projected to experience positive impacts on labor productivity, the highest being the Russian Federation (+0.5 percent), Canada (+0.4 percent), and China (+0.2 percent).

Id.

14. Qihao He, CLIMATE CHANGE AND CATASTROPHE MANAGEMENT IN A CHANGING CHINA: GOVERNMENT, INSURANCE, AND ALTERNATIVES, INTRODUCTION (Edward Elgar Publishing Limited 2019) (page number not available yet), https://books.google.com/

when 150 countries staged strikes around the global climate summit in September 2019 in New York City, convened by United Nations secretary-general António Guterres.[15] Meeting four years after the Paris climate agreement, which sought to limit global temperatures to 1.5–2 °C above pre-industrial levels, Guterres's goal was to further momentum as nations prepare for a new round of commitments next year.[16]

In understanding the post Paris energy transitions, this Article analyzes the intergovernmental organization, IRENA, as a means of working toward sustainable energy. Clean energy is an alternative to carbon emissions from fossil fuel extraction and generation.[17] This Article looks at the formation and rise of IRENA and how the silencing of the climate controversy may continue to improve its efficacy. In other words, IRENA has steered away from the controversy of climate change i.e. climate denial.[18] This Article

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books?id=JAyEDwAAQBAJ&ppis=_c&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false [https://perma.cc/48FD-4U6D].

15. Jeff Tollefson, *The hard truths of climate change – by the numbers* (Sept. 18, 2019), https://www.nature.com/immersive/d41586-019-02711-4/index.html [https://perma.cc/KJ4P-MZ6G].

16. *Id.*

17. Andy Haines et al, *Policies for accelerating access to clean energy, improving health, advancing development, and mitigating climate change*, 370 THE LANCET 6, 6–12, (2007), https://www.sciencedirect.com/science/article/pii/S0140673607612574 [https://perma.cc/MR7C-P4EK].

> … current patterns of fossil-fuel use cause substantial ill-health from air pollution and occupational hazards. Impending climate change, mainly driven by energy use, now also threatens health. Policies to promote access to non-polluting and sustainable sources of energy have great potential both to improve public health and to mitigate (prevent) climate disruption. There are several technological options, policy levers, and economic instruments for sectors such as power generation, transport, agriculture, and the built environment. However, barriers to change include vested interests, political inertia, inability to take meaningful action, profound global inequalities, weak technology-transfer mechanisms, and knowledge gaps that must be addressed to transform global markets. The need for policies that prevent dangerous anthropogenic interference with the climate while addressing the energy needs of disadvantaged people is a central challenge of the current era. A comprehensive programme for clean energy should optimise mitigation and, simultaneously, adaption to climate change while maximising co-benefits for health—e.g., through improved air, water, and food quality. Intersectoral research and concerted action, both nationally and internationally, will be required.

Id.

18. Johannes Urpelainen & Thijs Van de Graaf, *The International Renewable Energy Agency: a success story in institutional innovation?*, INT'L ENVTL. AGREEMENTS (2015), at 15:159–177 DOI 10.1007/s10784-013-9226-1. "IRENA has skirted away from debates

will proceed in five parts. Part I explores the formation of IRENA and the positive outcomes of renewable energy deployment. Part II addresses post-extraction possibilities and the need for global energy sector cooperation and development. Part III explores how IRENA works as an epistemic institution, providing solutions to the Paris Agreement's possible goals. Part IV considers post-Paris energy transitions against predictions of more gradual renewable energy deployment. Part V analyzes the variables of the coronavirus pandemic for energy regime complex, which could limit IRENA's growth if the constraints remain unaddressed.

I. UNDERSTANDING THE IRENA STATUTE

The idea for an international agency focused on renewable energy occurred in 1981 at the United Nations Conference on New and Renewable Sources of Energy in Nairobi, Kenya.[19] The 1981 meeting was concerned about creating an opportunity "to discuss modalities and the first components of machinery for the gradual and smooth transition from the present, mainly oil-based world economy, to one in which the non-depletable sources of energy will play a more important part."[20] The idea was explored further by major organizations in the field of renewable energy, including Eurosolar.[21] As global interest in renewable energy steadily increased, world leaders convened in several settings to focus on renewable energy policies, financing and technology.[22] Key meetings included the World Summit for Sustainable Development 2002 in Johannesburg, South Africa, the annual G-8 Gleneagles Dialogue, the 2005 Beijing International Renewable Energy Conference, and the 2004 Bonn International Renewable Energy Conference with concluding resolution at Bonn included support for the establishment of IRENA, supported by the International Parliamentary Forum on Renewable Energies.[23]

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on climate change, but still been able to provide policy solutions. The IRENA model can be applied more broadly for environmental and energy organizations." *Id.*

19. Enrique Iglesias, *Objectives of the United Nations Conference on New and Renewable Sources of Energy*, 5 OPEC REVIEW: ENERGY ECONOMICS (June 1981), https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1468-0076.1981.tb00542.x [https://perma.cc/Y3YH-7GBV].

20. *Id.* Back in 1978, there was a concern for the essential nature of energy to civilization and for the prosperity of humans. Past, present and future lifestyles were based on the quantity and quality of available energy.

21. Martin Lugmayr, ENCYCLOPEDIA OF GLOBAL WARMING AND CLIMATE CHANGE, 788 (S. George Philande ed., 2012), https://books.google.com/books?id=sEo9CQAAQBAJ&printsec=frontcover#v=onepage&q&f=false [https://perma.cc/V25Y-SY2J].

22. *History*, IRENA, https://www.irena.org/history [https://perma.cc/92ZV-2TN7].

23. *Id.*

As a UN affiliated organization, IRENA, which held its first official meeting in 2009. IRENA offers support to countries in their transition to a sustainable energy future and serves as the principal platform for international cooperation, and a repository of policy, technology, resource, and financial knowledge of renewable energy.[24] IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar, and wind energy, in pursuit of sustainable development, energy access, energy security, and low-carbon economic growth and prosperity.[25]

At IRENA's first Preparatory Conference in Berlin in April 2008, 170 representatives from 60 nations supported the idea of the "IRENA Initiative" and to increase its political momentum.[26] IRENA's goal was to become the world's first intergovernmental organization focused on renewable energy. In two preparatory workshops, more than 100 representatives from 44 nations attended and discussed the founding IRENA treaty, known as the IRENA Statute, financing mechanisms, and initial work program.[27] At the final preparatory conference in Madrid, more than 150 representatives from 51 nations met to discuss the establishment of a preparatory commission.[28] On January 26, 2009, IRENA was officially founded in Bonn, Germany. At the time, "[g]overnments worldwide made clear their commitment to changing the global energy paradigm, with 75 states signing the IRENA Statute.[29] The vision and mission of the IRENA Statute states as follows:

24. *About IRENA*, IRENA, https://www.irena.org/aboutirena [https://perma.cc/5YSV-NVBQ].
25. *Id.*
26. IRENA, *supra* note 22.
27. *Id.*
28. *Id.*
29. *Id.* In IRENA Preparatory Commission Sessions from 2009-2011, representatives from signatory states developed "the institutional structures for this new intergovernmental organisation and made further progress on implementing decisions taken the Final Preparatory Conference." *Id.* "At the second session in June 2009, Abu Dhabi, of the United Arab Emirates, was selected to host the interim headquarters of IRENA. Helene Pelosse, a French citizen, was appointed Interim Director-General." *Id.* "Following the entry into force of the IRENA Statute on 8 July 2010, preparations began for the first Assembly of IRENA. On 4 April 2011, only three years after the first conference to discuss IRENA's formation, the preparatory commission was disbanded and IRENA was officially born." *Id.*

- desiring to promote the widespread and increased adoption of renewable energy with a view to sustainable development,
- inspired from firm belief in the vast opportunities offered by renewable energy for addressing and gradually alleviating problems of energy security and volatile energy prices,
- convinced of the major role that renewable energy can play in reducing greenhouse gas concentrations in the atmosphere, thereby contributing to the stabilisation of the climate system, and allowing for a sustainable, secure and gentle transit to a low-carbon economy,
- desiring to foster the positive impact that renewable energy technologies can have on stimulating sustainable economic growth and creating employment,
- motivated by the huge potential of renewable energy in providing decentralised access to energy, particularly in developing countries, and access to energy for isolated and remote regions and islands,
- concerned about the serious negative implications that the use of fossil fuels and the inefficient use of traditional biomass can have on health,
- convinced that renewable energy, combined with enhanced energy efficiency, can increasingly cover the anticipated steep increase in global energy needs in the coming decades, and
- affirming their desire to establish an international organisation for renewable energy that facilitates the cooperation between its Members, while also establishing a close collaboration with existing organisations that promote the use of renewable energy.

Have agreed to establish the International Renewable Energy Agency.[30]

The clarity of IRENA's Statute is astonishing. Renewable energy was the missing link in the next era of human civilization. A world working toward reductions in poverty was essential. And that change would not be achieved in a hydrocarbon extractivist economy. The new era of the Anthropocene would need to consider the social and environmental costs of fossil fuels as well as even so-called renewable technologies such as agricultural and forest biomass, which have other adverse impacts on human health and impacted food security, as well the need for international cooperation. A future beyond conflict, which the first Director-General Adnan Amin envisioned, was possible. Yet the future beyond conflict would only occur if there were no violence over the barrels of petroleum for the market of the petrodollar.

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30. *IRENA Mission*, IRENA, https://www.irena.org/statutevisionmission [https://perma.cc/DTN5-SB7J].

The principal organs of IRENA are structured similar to other intergovernmental institutions, consisting of the Assembly, the Council, and the Secretariat.[31] The primary decision making authority is the IRENA Assembly, which consists of one representative from each Member, convening on an annual basis typically before the start of Abu Dhabi Sustainability Week.[32] This body works on and generates the work programme, budget, adoption of reports, membership applications, and any potential amendments to IRENA activities.[33] The next part of organizational structure is the IRENA Council, which includes 21 Member States, elected for two-year terms and remain accountable to the Assembly.[34] What is unique about IRENA's Council is that membership rotates to provide effective representation of both on the basis of development levels and geographic distribution.[35] The duties of the Council include facilitation of consultation and cooperation among IRENA Members and of the review the draft work programme, draft budget and annual report.[36] The final and most crucial part of IRENA is the work of the Secretariat, which consists of the office of the Director-General and its staff to provide administrative and technical support to the Assembly, the Council, and various subsidiary bodies. The office of the Secretariat is responsible for the preparation and submission of IRENA's draft work programme, budget and annual report along with the work programme's implementation.[37]

In the ten year since its founding IRENA has shared an array of information and technology known-how in the form of the following:

- Annual reviews of renewable energy employment;
- Renewable energy capacity statistics;
- Renewable energy cost studies;
- Renewables Readiness Assessments, conducted in partnership with governments and regional organisations, to help boost

31. *Institutional Structure*, IRENA, https://www.irena.org/institutionalstructure [https://perma.cc/79MB-E39B] (last updated 2019).

32. *Id.* The IRENA Statute states that membership in the agency is open to states which are members of the United Nations as well as to regional intergovernmental economic-integration organizations. *IRENA Membership*, IRENA, https://www.irena.org/irenamembership [https://perma.cc/3XVZ-ZJXD].

33. *IRENA Membership*, *supra* note 32.

34. *Id*.

35. *Id*.

36. *Id*.

37. *Id*.

renewable energy development on a country by country basis;
- The Global Atlas, which maps resource potential by source and by location;
- Renewable energy benefits studies;
- REmap, a roadmap to double renewable energy use worldwide by 2030;
- Renewable energy technology briefs;
- Facilitation of regional renewable energy planning;
- Renewable energy project development tools like the Project Navigator, the Sustainable Energy Marketplace and the IRENA/ ADFD Project Facility.[38]

These types of technical reports and planning tools remove barriers to entry in the renewable energy markets, making financing and investment options more accessible. Section IV highlights the IRENA Global Atlas and the Renewables Readiness Assessment as technological tools to advance the research, development, and deployment of renewables.

II. POST-EXTRACTION BEYOND OPEC

In a desert oasis surrounded by oil and gas reserves, experts, world diplomats, technocrats, academics, and journalists convene at IRENA to synergize ideas for the energy needs of current and future generations.[39] IRENA's success hinged on the ways in which it ignored skeptics of renewable energy and raced ahead with innovation, technology, and policy designs for the twenty-first century. IRENA darts ahead without causing controversy.[40] If the 2015 Paris Agreement was a bonanza for green finance and clean energy, IRENA would take the windfall and propel public-private partnerships in a tight space constrained by demands of massive development banks, such as the World Bank and the International Monetary Fund. IRENA, unlike the International Energy Agency (IEA), headquartered in Paris, was centralized in the Global South energy hub of Abu Dhabi, a city teeming from the energy boom from petroleum, natural gas, and the latest advancements in deep seabed drilling to liquification.[41]

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38. IRENA, *supra* note 22.

39. *History*, IRENA, https://www.irena.org/history [https://perma.cc/92ZV-2TN7] (last updated 2019).

40. IRENA, *A New World: The Geopolitics of Energy Transformation*, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/Global_commission_geopolitics_new_world_2019.pdf [https://perma.cc/HY6S-HC7P].

41. Michael Quintin Morton, *The Search for Oil Offshore Abu Dhabi* (Aug. 6, 2018), https://explorer.aapg.org/story/articleid/31107/the-search-for-oil-offshorAe-abu-dhabi [https://perma.cc/7CE2-LLWY].

Meanwhile, the United Arab Emirates became a tourist destination and not merely the crossroads of commerce between East and West. Tourists from around the world flock to places like the 24 karat gold *souk* in the Madinat Zayed Shopping Center[42] and swanky resorts, like Zaya Nurai Island, with imported dragon fruit[43] when they would venture to the posh corners of Abu Dhabi's shores on man-made archipelagos.[44] The descendants of former Western colonizers felt pangs of jealousy for the accelerated economic growth that occurred with exploitative labor forces from further east in Asia Major. "How could these barbarians and desert nomads build so much," they wondered. The rapid development in the Gulf even led current U.S. President Donald Trump to say in 2012 that he was "jealous that the UAE is home to the world's tallest tower."[45] Even I grew jealous of the UAE when I saw their efficiency in screening passengers and cleaning the airports and trains during the 2020 coronavirus outbreak. David Hume commented on how prosperity of the trade of other countries leads to jealousy.[46] The secret of the emirate was no surprise—reverse colonialism.[47] The same techniques used to propel Western industrialization—forced labor,

42. *Madinat Zayed Shopping Center*, TRIP ADVISOR, https://www.tripadvisor.com/ShowUserReviews-g294013-d2647208-r613969587-Madinat_Zayed_Shopping_Center-Abu_Dhabi_Emirate_of_Abu_Dhabi.html [https://perma.cc/PMX6-FFTM] (last visited Jan. 25, 2020).

43. *Ole to Olea*, TRIP ADVISOR, https://www.tripadvisor.com/ShowUserReviews-g294013-d2664745-r592168732-Olea-Abu_Dhabi_Emirate_of_Abu_Dhabi.html [https://perma.cc/V5AD-NYBW].

44. *Zaya Nurai Island*, TRIP ADVISOR, https://www.tripadvisor.com/Hotel_Review-g294013-d7289439-Reviews-Zaya_Nurai_Island-Abu_Dhabi_Emirate_of_Abu_Dhabi.html [https://perma.cc/T9C5-3ELN].

45. Carol Huang, *Trump tells Dubai property conference: 'I'm jealous of Burj'*, THE NATIONAL, Mar. 11, 2012, https://www.thenational.ae/uae/trump-tells-dubai-property-conference-i-m-jealous-of-burj-1.390727 [https://perma.cc/4MGJ-QBL3].

46. David Hume, "[h]aving endeavoured to remove one species of ill-founded jealousy, which is so prevalent among commercial nations, it may not be amiss to mention another, which seems equally groundless. Nothing is more usual, among states which have made some advances in commerce, than to look on the progress of their neighbours with a suspicious eye, to consider all trading states as their rivals, and to suppose that it is impossible for any of them to flourish, but at their expence." The Jealousy of Trade; *See also* ISTVAN HONT, JEALOUSY OF TRADE: INTERNATIONAL COMPETITION AND THE NATION-STATE IN HISTORICAL PERSPECTIVE (2010).

47. Bipan Chandra, *Colonialism, Stages of Colonialism, and the Colonial State*, 10:3 J. CONTEMP. ASIAN 272 (1980), https://www.tandfonline.com/doi/abs/10.1080/00472338085390151?journalCode=rjoc20 [https://perma.cc/A3J9-RBLF]; *see generally* Bernard Freamon, WHAT THE RIGHT HAND POSSESSES: THE PROBLEM OF SLAVERY IN ISLAMIC LAW AND MUSLIM CULTURES (2019).

lack of political and civil rights, and manipulative corporatism were all part of the development milieu.[48] The Middle East drillers and their sovereign wealth fund managers realized an economic paradigm that their U.S. and Latin American extractivist counterparts failed to see and/or lacked the resources to conceptualize—maximization of fossil fuel output means resource conservation.

> Save the oil for those who cannot wean themselves off the oil.[49]
> Transform the Arab energy grids to renewables.[50]
> Sell oil to whomever will pay the most.[51]
> Build solar – everywhere.[52]

The cost parity for renewables was tipping to outperforming the markets.[53] "The latest project shows that solar schemes are no longer simply vanity projects for the Gulf's oil-rich countries, but form a key part of long-term energy goals."[54] All the while, Americans cannot stop their insatiable cravings for oil—from McMansions to marauding SUVs. The Middle East drillers counted on the political strife on climate change. They hedged against American energy innovation. They funded environmental activism in the United States and Canada to limit production.[55] They knew

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48. *See generally* Roger Owen, STATE, POWER, AND POLITICS IN THE MAKING OF THE MODERN MIDDLE EAST (3rd ed. 2004).

49. Ben Hubbard & Kate Kelly, *Saudi Arabia's Grand Plan to Move Beyond Oil: Big Goals, Bigger Hurdles*, N.Y. Times (Oct. 25, 2017), https://www.nytimes.com/2017/10/25/world/middleeast/saudi-arabias-grand-plan-to-move-beyond-oil-big-goals-bigger-hurdles.html [https://perma.cc/Q82D-FNPJ].

50. MASDAR INSTITUTE & IRENA, RENEWABLE ENERGY PROSPECTS: UNITED ARAB EMIRATES, REMAP 2030 1 (2015), https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_REmap_UAE_report_2015.pdf [https://perma.cc/ER3Z-A7GW].

51. Panos Mourdoukoutas, *Who Controls Middle East Oil Prices?*, FORBES (Feb. 2, 2016), https://www.forbes.com/sites/panosmourdoukoutas/2016/02/02/who-controls-middle-east-oil-prices/#a978d5556f0b [https://perma.cc/TZJ7-ZPYP].

52. Meed, *Solar schemes no longer just vanity projects in the Middle East*, POWER TECHNOLOGY (July 26, 2019), https://www.power-technology.com/comment/middle-east-solar-projects-2019/ [https://perma.cc/YP7X-CQBV]. "The emirate was the first country in the Middle East and North Africa to install a utility-scale solar plant in 2013, when it commissioned the 100MW Shams concentrated solar power (CSP) project—which, at the time, was the largest CSP installation in the world." *Id.*

53. Tim Buckley, *Tipping Point: Global Renewable Energy Leaders Outperform on Global Equity Markets*, INSTITUTE FOR ENERGY ECONOMICS AND FINANCIAL ANALYSIS (Dec. 2019), https://ieefa.org/wp-content/uploads/2019/12/Global-Renewable-Energy-Leaders-Outperform-on-Global-Equity-Markets_December-2019.pdf [https://perma.cc/2MYZ-GNZ9].

54. Meed, *supra* note 52.

55. Jessica Clogg, *Time to stop blaming "foreign funded" environmentalists for the oil industry's woes*, WEST COASTAL ENVTL. LAW BLOG (Jan. 30, 2019), https://www.wcel.org/blog/time-stop-blaming-foreign-funded-environmentalists-oil-industrys-woes [https://perma.cc/2Y6D-UEKF].

us better than we knew ourselves. They knew we craved every last drop of oil.[56]

IRENA was a sharp contrast to the Organization of Petroleum Exporting Countries (OPEC), which consisted of 14 oil-exporting nations. Founded in 1960, OPEC sought "to coordinate the petroleum policies of its members, and to provide member states with technical and economic aid."[57] The Americans and Europeans refer to OPEC as a cartel, when it was actually formed as an attempt at natural resource sovereignty. The how-dare-they moment arrived in 1973 in the form of an oil embargo to exert political pressure, but it fizzled in the coming decades as economic alliances fractured ethnic and religious allegiances.[58] Yet some of the fault lines intensified as energy consumption and population growth put the warming planet at a brink. The post-World War I and World War II disputes followed by a period of Cold War exposed the precarious nature of a warming planet. The wars of the 1970s to the1990s were waged over oil,[59] but the future conflicts are likely to be fought over water, as sea-level rise decreases available freshwater and land.[60] The planet was shrinking and warming all the same. Where "bombs followed oil, [now] drones followed drought."[61]

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56. *See generally* Walter Youngquist, *The Post-Petroleum Paradigm—and Population*, 40 POPULATION AND ENVIRONMENT ENV'T 297 (1999), https://link.springer.com/article/10.1023%2FA%3A1023345409511 [https://perma.cc/C3BC-WK29].

57. Encyclopedia Britannica Albert Danielsen, *OPEC*, Encyclopedia Britannica, *OPEC: An International Organization* (May 15, 2019), https://www.britannica.com/topic/OPEC [https://perma.cc/8FAF-JCAH].

58. *Id*.

59. Matthias Basedau & Jann Lay, *Resource Curse or Rentier Peace? The Ambiguous Effects of Oil Wealth and Oil Dependence on Violent Conflict*, 46 J. PEACE RES. 757–76 (1999), https://doi.org/10.1177/0022343309340500 [https://perma.cc/TR9U-5X4N].

60. Paul Ratner, *Where will the 'water wars' of the future be fought?*, WORLD ECON. F. (Oct. 23, 2018), https://www.weforum.org/agenda/2018/10/where-the-water-wars-of-the-future-will-be-fought [https://perma.cc/9HUA-UTVN].

61. Naomi Klein, *Let Them Drown: The Violence of Othering in a Warming Planet,* 28 LONDON REVIEW OF BOOKS 11–14 (June 2, 2016), https://www.lrb.co.uk/v38/n11/naomi-klein/let-them-drown [https://perma.cc/7WWC-V4YD].

> When you map the targets of Western drone strikes onto the region, you see that 'many of these attacks – from South Waziristan through northern Yemen, Somalia, Mali, Iraq, Gaza and Libya – are directly on or close to the 200 mm aridity line.' The red dots on the map above represent some of the areas where strikes have been concentrated. To me this is the most striking attempt yet to visualise the brutal landscape of the climate crisis. All this was foreshadowed a decade ago in a US military report. 'The Middle East,' it observed, 'has always been associated with two natural resources, oil (because of its abundance) and water (because of its scarcity).' True enough. And now certain patterns have become

Climate change, financial crises, food insecurity, labor disruptions, terrorism, and natural disasters were taking their toll worldwide. Renewable energy generation emerged as a way to improve development outcomes and conserve the planet and stabilize uncertainty in systems and peoples. A win-win proposition in a win-lose reality.[62] The criticality of the need for IRENA was readily apparent. It was not only a way to attempt to flip the extraction narrative, but also a way to preserve the maximization of oil output for the Middle East drillers.[63]

The time horizon for OPEC is shrinking as its petroleum reserves dwindle. Changes in technology will not be able to outpace demand for oil. OPEC has worked to "expand[]its powers through the alliance with Russia and another ten non-member countries, a pact it aims to make permanent."[64] The decline for oil consumption will be gradual and slow. "OPEC has a built-in competitive advantage, since its Middle Eastern members can produce crude at about a third of the cost of U.S. shale."[65] Meanwhile, OPEC's market share has shrunk since "its 1970s heyday."[66] Increasing demand for electric vehicles and renewable energy technology could also impact peak oil.[67] General equilibrium models analyze the economic costs of oil production and refinement, including the broader macroeconomic implications through a precautionary motive.[68] Oil shocks and other factors that impact price

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> quite clear: first, Western fighter jets followed that abundance of oil; now, Western drones are closely shadowing the lack of water, as drought exacerbates conflict.

Id.

62. *See generally* ANAND GIRIDHARADAS, WINNER TAKES ALL: THE ELITE CHARADE OF CHANGING THE WORLD (2019). *See also* Michael L. Ross, *Does Oil Hinder Democracy?* (Apr. 2001), https://www.cambridge.org/core/journals/world-politics/article/does-oil-hinder-democracy/67665D8D240C8F43CD4A2DCB35894071 [https://perma.cc/7U9N-GPXK].

63. *Id*.

64. Grant Smith, *OPEC Fights Back*, BLOOMBERG (June 27, 2019), https://www.washingtonpost.com/business/energy/opec-fights-back/2019/06/27/e0bf22b4-98c8-11e9-9a16-dc551ea5a43b_story.html [https://perma.cc/GH95-ZFNM].

65. *Id.* "Its current intervention has struggled to maintain higher prices. Plus, the threat of shale is bigger than ever, threatening to break OPEC's hold over the market permanently." *Id*.

66. *Id.*

67. *Id.*

68. Conny Olovsson, *Oil prices in a general equilibrium model with precautionary demand for oil*, 39 REV. ECON. DYNAMICS 1 (2019), https://www.sciencedirect.com/ science/ article/pii/S1094202518300218 [https://perma.cc/TG6N-JRMQ].

> The driving forces are factor-specific technology shocks, oil supply shocks, and news shocks about future oil supply. Storage and the zero lower bound on stored oil are crucial for the model to match observed business-cycle statistics, the relationship between oil price changes and recessions, and for generating state-dependent responses to shocks. Large oil-price increases are mainly driven by increasing precautionary/smoothing demand for oil. Most of the time, oil-related shocks are of limited importance for the business cycle, but when oil inventories

make the fluctuations in oil prices more complex to analyze than standard supply and demand models.[69] Economic factors, though, are what allow for oil and natural gas markets to continue unabated. The market share of coal globally has declined over time, but oil and natural gas may peak sooner or later depending on economic conditions and market fluctuations. During discussions for IRENA in 1998, peak oil was predicted for 2004–2005. But the models for peak oil changed as new technologies emerged.[70]

> are low, negative news about the future oil supply can drive the economy into a recession that is triggered by oil scarcity.

Id.

69. Dario Caldara, Michele Cavallo, and Matteo Iacoviello, *Oil price elasticities and oil price fluctuations*, 103 J. MONETARY ECON. 1 (2019), https://www.sciencedirect.com/science/article/abs/pii/S030439321830463X [https://perma.cc/KT6R-PU4W].

> Studies identifying oil shocks using structural vector autoregressions (VARs) reach different conclusions on the relative importance of supply and demand factors in explaining oil market fluctuations. This disagreement is due to different assumptions on the oil supply and demand elasticities that determine the identification of the oil shocks. We provide new estimates of oil-market elasticities by combining a narrative analysis of episodes of large drops in oil production with country-level instrumental variable regressions. When the estimated elasticities are embedded into a structural VAR, supply and demand shocks play an equally important role in explaining oil prices and oil quantities.

Id.

70. Ugo Bardi, *Peak oil, 20 years later: Failed prediction or useful insight?*, 48 ENERGY RES. & SOC. SCI. 257, https://www.sciencedirect.com/science/article/pii/S2214629618303207 [https://perma.cc/682S-9CNN].

> In March 1998, Scientific American published a paper titled "The End of Cheap Oil," signed by two petroleum geologists, Colin Campbell and Jean Laherrère. It was a re-examination of a model developed for the first time by Marion King Hubbert in 1956 which assumed that the oil production in a large geographical region follows a symmetric, bell-shaped curve. According to this interpretation, the peak production is reached when approximately half of the available oil resources are extracted. The concept was also occasionally referred to as the "oil mountain" although the term "bell shaped curve" or "Hubbert Curve" remained always more popular. In 1956, Hubbert had applied his model to the United States, finding that production would peak around 1970. It turned out to be a correct prediction and the US production approximately followed the model until the early 2000s. Regarding the whole world, Hubbert proposed that the production of conventional oil would peak around the year 2000.
>
> Hubbert's ideas had been largely forgotten in the 1990s as the result of the general optimism arising from the collapse in the oil prices of the second half of the 1980s. The low oil prices had convinced nearly everybody that oil depletion was not a problem for the foreseeable future but, in 1998, Campbell and Laherrère updated Hubbert's predictions using the same "bell-shaped" model and updated estimates of the global oil reserves. Their results were broadly

The timeframe for peak oil kept expanding. No industry is more invested in renewables than the oil and gas sector. Yet oil companies, their lobbyists, and the governments of net-energy exporters have worked to weaken the transition because of the steep profit margins. Big Oil and OPEC control price points to limit the transition, to make it gradual, instead of overnight in the wake of hurricanes that can wipe out entire energy systems. The next section explores how in the face of these energy transitions obstacles, IRENA can cautiously work to tip the scales toward renewables. The invisible hand of OPEC monitors energy transitions as it is the most invested against explosive growth of renewables.

III. IRENA AS AN EPISTEMIC INSTITUTION

The literature on global energy governance is limited on analysis of IRENA. This lack of attention may be related to IRENA's origins in the Global South. International relations experts Johannes Urpelainen and Thijs Van de Graaf noted that global energy governance has studied the roles of institutions such as the International Energy Agency (IEA), OPEC, the G8 and G20, and the UN, but not IRENA.[71] In fact, this U.S. law review article is the first to explore IRENA in any capacity from a legal academic perspective. U.S. international environmental and energy law literature is replete with studies on global governance relating to IEA, OPEC, Kyoto Protocol, Paris Agreement, and UNFCCC, but does not include the study of IRENA.[72] This oversight can be attributed simply to lack of resources for the study of Global South international organizations or the Gulf Region and language barriers.

Yet other reasons for the lack of attention given to IRENA are the bias and willful ignorance of Westerners have toward Global South institutions: being of poor quality, and following the colonial paradigm of ineffective development and implementation of successful governance strategies.[73]

> consistent with those obtained earlier on by Hubbert: according to the new estimate, the global oil production would peak approximately in 2004–2005 and then start an irreversible decline.

Id.

71. Urpelainen & Van de Graaf, *supra* note 18.

72. *Id.*

73. Usman Tar, *Rentier Politics, Extractive Economies and Conflict in the Global South: Emerging Ramifications and Theoretical Exploration*, *in* EXTRACTIVE ECONOMIES AND CONFLICTS IN THE GLOBAL SOUTH: MULTI-REGIONAL PERSPECTIVES ON RENTIER POLITICS 27, 40 (Kenneth Omeje ed., 2008).

> State, institutions and governance: this entails the poor 'quality' of political institutions (such as the nature of property rights arrangements and the quality of state bureaucracy) which significantly determines the manner in which natural resource rents are managed and distributed—largely to the benefit of a

For Westerners, the Global South, which historically provided the raw materials and labor, could not possibly provide the brainpower for its developmental problems–(let alone beneficial solutions to teach First World Nations). Having a Global South institution ahead of the curve was too much to fathom. Who would think the Middle East could offer any meaningful input for sustainable development goals? They were too distracted by war and political instability to produce any substantive policy outcomes.

Even I was guilty of this bias.[74] Those Gulf Arabs in Dubai with all their oil money had nothing to do besides have a police force with Lamborghinis.[75] They were the epitome of opulence and ignorance. I could not have been more wrong. As an Orlando-born, Berkeley-educated energy professional with two law degrees, the author had never heard of Masdar until it was mentioned by an executive from Santander Bank in 2013 in Doha, Qatar.[76] "You should go visit Masdar," I was told. An entire slew of academic institutions and policymakers were thriving in Masdar City as my later Google search revealed. In 2014, I would learn of IRENA from Professors Nick Robinson and Richard Ottinger as a visiting assistant professor at Pace Law School in White Plains, New York. Visiting Masdar City for the opening of the IRENA building as an energy scholar was the equivalent of being Jasmine on a magic carpet scene in Disney's *Aladdin* and seeing that "Whole New World."

The lack of transformational energy transitions led to more focus on IRENA in literature on energy policy. Urpelainen and Van de Graaf observed, "When the stalemate in the post-Kyoto negotiations became apparent in Copenhagen, for example, many observers turned to the G20 or the Major Economies Forum as a possible alternative or complementary forums to break the impasse without noting or seriously considering IRENA's potential

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> predatory governing elites. Applied to extractive economies of the global south, the consensus is that the existence of neo-patrimonial culture has adverse effect on the state and the elite's capacity for social provisioning with far-reaching implications for violence.

Id.

74. *See generally* IBRAM KENDI, HOW TO BE AN ANTI-RACIST (2019).

75. Dylan Reynolds & Lauren Said-Moorhouse, *Watch Out Street Races, Dubai Cops have Lamborghini*, CNN (Apr. 12, 2013), https://edition.cnn.com/2013/04/11/world/meast/dubai-police-lamborghini [https://perma.cc/2UBU-9HTG].

76. *Doha Santander Grants Program*, Institute for Global Law & Policy (Jan. 28, 2013), http://iglp.law.harvard.edu/scholarly-resources/dohagrants/ [https://perma.cc/6Q2Z-VU5L] (Santandar Bank had awarded research grants in 2013 at the workshop in Doha, Qatar, sponsored by the Harvard Institute for Global Law and Policy).

in this regard."[77] IRENA's efforts to develop scale is evidenced in its role as an epistemic institution:

> IRENA's role as an epistemic institutions can be understood in the light of a body of international relations scholarship on what international institutions can and cannot do. Many scholars emphasize the difficulties that such institutions face in trying to enforce and constrain state behavior, instead proposing that international institutionalization is more effective when it contributes to capacity building, information sharing, and coordination.[78]

The lack of successful environmental global governance institutions paves the way for consideration of IRENA as a part of renewable energy design, deployment and policy discussions. Despite policy shortfalls, limited current political clout, and the overreliance on development banks for finance and funding, IRENA deserves attention due to its public private partnerships, collaborative efforts, and technologies that improve recognition of global renewable energy regimes.

IRENA's progress may plateau without a cognizant shift towards distinguishing key energy power brokers in the Middle East and South America from the OPEC bloc, and more emphatic North-South and South-South cooperation instead of a primary focus on East-West cooperation. Analysis of this international agency is especially critical in light of the emerging geopolitical crises and energy security alarms. Further, concerns are the economic, political, and social factors that created IRENA and how this fledging intergovernmental organization can also be used as a partnership to strengthen the Energy Charter Treaty and to shift OPEC's focus on hydrocarbons.

IRENA's vision is not short of ambition. IRENA's Remap 2030 is a global roadmap for doubling the share of renewable energy mix by 2030.[79] IRENA aims to achieve higher renewable energy uptake, increased access to modern energy services, and improve energy services.[80] Today, 160 countries (including the European Union) have officially joined IRENA, and another 23 countries are in the process of becoming members through accession.[81] That would bring the total to 183. By comparison, the 44-year-old International Energy Agency has only 30 members,[82] while the

77. Urpelainen & Van de Graaf, *supra* note 18.
78. *Id.*
79. Adnan Z. Amln, *Forward* to IRENA, REMAP 2030: A RENEWABLE ENERGY ROADMAP, SUMMARY OF FINDINGS at 3 (2014).
80. IRENA, REMAP 2030: A RENEWABLE ENERGY ROADMAP 43 (2014).
81. *IRENA Membership*, IRENA, *supra* note 32.
82. *Membership*, IEA (Dec. 2, 2019), https://www.iea.org/countries/members/ [https://perma.cc/CKE7-L4T7].

International Atomic Energy Agency, founded in 1957, has 171 members.[83] Notably, IEA requires membership in the OECD to join.[84] This elite status in the OECD shows the bias against Global South institutions and nations in global governance strategies. IRENA also serves as a counterbalance to the existing agencies that have long represented fossil fuel and nuclear industries. Canada was a founding member of the IEA and IAEA, yet Canada was the only G8 countries not part of IRENA in 2014.[85] It has since joined. In fact, all other G8 countries were founding members of IRENA.[86] Canada's delay in joining IRENA is notable as even China, India, Australia, Saudi Arabia and Iran already joined by 2015. Even conflict-weary Syria is in the process of joining IRENA.[87] The only other large country that sits with Canada outside of this massive international group is Brazil, which is currently in the process of accession. Brazil and Canada's delays can be correlated to the large extractive economies in these nations.[88] IRENA's global governance strategy is line with the Energy Charter Treaty, which will be discussed in the next subsections along with the Paris Agreement. IRENA can deliver the building blocks for global energy governance put in motion by the Energy Charter Treaty and the Paris Agreement.

A. Energy Charter Treaty

> *By facilitating synergy with the WTO rather than fragmentation, the ECT thus serves as a complementary forum in addressing the complexities of energy regulation in international trade. The ECT can therefore be said to be strengthening the rule*

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83. *List of Member States*, IAEA (Feb. 5, 2019), https://www.iaea.org/about/governance/list-of-member-states [https://perma.cc/RBA2-FJKS] (Feb. 5, 2019) (The following nations were part of the original block of countries to join the IAEA in 1957: Afghanistan, Albania, Argentina, Australia, Austria, Belarus, Brazil, Bulgaria, Canada, Cuba, Denmark, Dominican Republic, Egypt, El Salvador, Ethiopia, France, Germany, Greece, Guatemala, Haiti, Holy See, Hungary, Iceland, India, Indonesia, Israel, Italy, Japan, Republic of Korea, Monaco, Morocco, Myanmar, Netherlands, New Zealand, Norway, Pakistan, Paraguay, Peru, Poland, Portugal, Romania, Russian Federation, Socialist Federal Rep. of Yugoslavia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States, Venezuela, Vietnam).

84. *Id*. "A candidate country must be a member country of the OECD. However, membership in the OECD does not automatically result in membership in the IEA."

85. Indra Overland & Gunilla Reischl, *A place in the sun? IRENA's position in the global energy governance landscape*, 17 INT'L ENVTL. AGREEMENTS: POL., LAW & ECON. 345 (2018).

86. THIJS VAN DE GRAAF, THE POLITICS AND INSTITUTIONS OF GLOBAL GOVERNANCE, 106-07 (David Elliott et al. eds., 2013).

87. IRENA, REMAP 2030, *supra* note 80.

88. Overland & Reischl, *supra* note 85.

> *of law and in so doing, providing a legally ordered institutional international environment in the energy sector. In this respect, the ECT's multilateral provisions that purport to advocate and constitute a model of good governance validate the assertion that there is to date no better alternative in the current global and interdependent energy world.*
>
> – Natasha Georgiou, energy regulation and international trade expert[89]

Formed at the heels of the Soviet collapse, the ECT sought to establish a cooperative framework for energy investment, exploration, production, and transport.[90] The impetus behind the ECT was to promote energy efficiency and mitigate environmental degradation.[91] Net-exporting nations would achieve a means to attract investment, protect their natural resources, and ensure reliable transportation for their energy exports.[92] Meanwhile, energy-importing nations would obtain protection for their outward energy investments and mechanisms to encourage supply security. Among the body of international laws, the ECT is the only set of international rules and regulations designed specifically for the energy sector, and it encompasses

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89. Natasha Georgiou, *A Rule Based Architecture for the Energy Sector, The WTO and the ECT* (Energy Charter Secretariat, Occasional Paper Series, Dec. 16, 2016).

90. Int'l Energy Charter Energy, *The Energy Charter Treaty (ECT)* (1994), https://energycharter.org/process/energy-charter-treaty-1994/energy-charter-treaty [https://perma.cc/6VKL-QD3D].

91. Int'l Energy Charter, *The Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA)* (Apr. 9, 2015), https://energycharter.org/process/energy-charter-treaty-1994/energy-efficiency-protocol [https://perma.cc/8LMG-KVFC].

92. *See* Andreas Goldthau & Jan Martin Witte, *The Role of Rules and Institutions in Global Energy: An Introduction*, *in* RULES AND INSTITUTIONS IN GLOBAL ENERGY 1, 8-9, https://www.brookings.edu/wp-content/uploads/2016/07/globalenergygovernance_chapter.pdf [https://perma.cc/88Q9-TEUP].

> In general, enforcement mechanisms vary across the rules of the game. Some institutions provide formal compliance mechanisms; others rely on voluntary commitments and peer pressure to promote implementation. However, all such mechanisms have an element designed to foster implementation and enforcement; this sometimes involves sanctions but in most cases is incentive based. In sum, these rules of the game play important roles in determining outcomes in international oil and gas markets. Obviously, the historical evolution underlying these rules of the game to some degree reflects the realities of the cold war era—an era characterized by significant increases in the discovery of supply stocks (and by occasional supply shocks); intensifying conflicts between producer and consumer nations following decolonization and the formation of OPEC; and the geostrategic competition for influence on major supplier countries in the Middle East and in Africa as a direct consequence of the great-power conflict. Thus, the structure of the rules of the game also reflects power differentials. Nonetheless, an exclusive focus on access to energy resources does not provide any guidance for analyzing current dynamics in international energy markets, nor does it provide a suitable lens through which to assess the implications of the fundamental shifts that are currently transforming these markets.

Id.

a diverse range of countries across Eurasia, including energy producers, consumers, and transit countries.[93] Fifty-four European and Asian countries have signed or acceded to the ECT.[94] With its current membership, the ECT has a natural focus on the evolving Eurasian energy market, including the Mediterranean region, the Middle East, and North Africa. Since Pakistan, China, Korea, Iran, and Association of South-East Asian Nations have all taken on observer status in recent years, the ECT's role will become increasingly significant in Asia. Yet without reconceiving the negotiation and dispute resolution rules to account for North-South and South-South frameworks for international legal norms, the ECT will also lack regional and international authority and legal effectiveness. The ECT is a crucial model and organizing tool for IRENA.

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93. Goldthau & Witte, *supra* note 92. *See also* Yulia Selivanova, *Trade in Energy: Challenges for International Trade Regulation*, WORLD TRADE ORGANIZATION (WTO), https://www.wto.org/english/res_e/publications_e/wtr10_forum_e/wtr10_11june10_e.htm [https://perma.cc/HM5V-DBK3]. ECT General Secretariat Yulia Selivanova observes two major questions to consider in the context to energy trade work:

> . . . [T]o what extent the existing or new rules could tackle (1) the non-discriminatory use of existing energy infrastructure and (2) the conditions to create an additional transportation capacity if available capacity is not sufficient. For the latter an effective investment framework is needed. The WTO has already experience with negotiating specific rules for another network industry, the—telecommunications sector. Here too, international trade may involve transmission by wires, although—by way of contrast to electricity and gas infrastructure—the fixed grid is now contestable by wireless telecommunications. While some lessons from these negotiations could be learned, the energy sector has some differences, especially with respect to security of supply and environmental concerns, which should be addressed.
>
> Some of the above issues are dealt with by the Energy Charter Treaty (ECT)—the only international treaty setting legal norms specific to energy trade and investment. Comprising 52 member states it includes in its membership countries across Eurasian continent from European Union to former Soviet Union republics to Japan. Non-derogation from the WTO rules is the cornerstone of the ECT. Moreover, the Treaty's trade regime applies WTO rules by reference to trade between its members that have not yet acceded to WTO. The last element— presence of investment rules enforceable through a dispute settlement system— makes the Energy Charter the only international energy investment treaty. Finally, the ECT deals specifically with issues of transit of energy materials and products via fixed infrastructure.

Id.

94. ENERGY CHARTER TREATY, *Energy Charter Treaty*, *Signatories/Contracting Parties*, https://energycharter.org/process/energy-charter-treaty-1994/energy-charter-treaty/signatories-contracting-parties [https://perma.cc/2V37-XR5X] (last visited Feb. 25, 2020).

The origins of the ECT can be traced to the early 1990's when the post-Cold War period offered a way to move past prior economic division.[95] The prospects for mutually beneficial cooperation became clear in the energy sector, which led to the idea of working toward a commonly accepted foundation for reorienting energy cooperation among Europe and Asia.[96] The interdependence of net energy exporters and net energy importers led to a recognition that "multilateral rules can provide a more balanced and efficient framework for international cooperation than is offered by bilateral agreements alone or by non-legislative instruments."[97] The ECT has a significant role in establishing the international framework for energy security through "the principles of open, competitive markets and sustainable development."[98]

Even though the ECT, created in 1994, is a young, multinational agreement, it is quite extensive. Article 2 states that ECT "establishes a legal framework in order to promote long-term cooperation in the energy field, based on complementarities and mutual benefits, in accordance with the objectives and principles of the Charter."[99] The ECT promotes investment liberalization through the establishment of an international legal order which ensures a level playing field and respect for the rule of law.[100] By providing a dispute resolution mechanism before international tribunals, investor confidence has increased through the ECT by investors and the financial community and ensures the investment and trade flows, which lead to economic growth.[101] The ECT was designed "to meet the need for multilateral rules for international cooperation on investment protection, which is required by

95. ENERGY CHARTER TREATY, *Energy Charter Treaty Process Overview*, https://energycharter.org/process/overview [https://perma.cc/R38Y-M73F] (last visited Feb. 25, 2020).

96. *Id.*

97. *Id.*

98. *Id.* ("The Energy Charter Treaty and the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects were signed in December 1994 and entered into legal force in April 1998. The Treaty was developed on the basis of the 1991 Energy Charter. Whereas the latter document was drawn up as a declaration of political intent to promote energy cooperation, the Energy Charter Treaty is a legally-binding multilateral instrument."). *Id.*

99. Energy Charter Treaty, art. 2 (Dec. 17, 1994), https://www.energychartertreaty.org/provisions/part-i-definitions-and-purpose/article-2-purpose-of-the-treaty [https://perma.cc/6M7J-7RB9].

100. ENERGY CHARTER SECRETARIAT, THE ROLE OF THE ENERGY CHARTER TREATY IN FOSTERING REGIONAL ELECTRICITY MARKET INTEGRATION: LESSONS LEARNT FROM THE EU AND IMPLICATIONS FOR NORTHEAST ASIA (June 2015), https://energycharter.org/fileadmin/DocumentsMedia/Thematic/Northeast_Asia_Study_EN.pdf [https://perma.cc/W5FE-6JX].

101. THE INTERNATIONAL ENERGY CHARTER CONSOLIDATED ENERGY CHARTER TREATY WITH RELATED DOCUMENTS (May 20, 2015), https://energycharter.org/fileadmin/DocumentsMedia/Legal/ECTC-en.pdf [https://perma.cc/X844-CB9D].

the increasing globalization of the world's economy, the interdependence of the energy sector, and the long-term and highly capital-intensive nature of energy projects."[102] To solidify and enhance the ECT's rulemaking bodies, investment protection measures, and dispute resolution mechanisms require further collaboration and cooperation by current observer nations and the loosening of the reins by its founding members. The move to cede power to achieve power will be the driver for change for the ECT's international energy investment protections. The ECT states its primary aim "is to strengthen the rule of law on energy issues, by creating a level playing field of rules to be observed by all participating governments, thereby mitigating risks associated with energy-related investment and trade."[103] The ECT fills gaps in global energy governance through energy sector specific rules.[104]

Critics, argue that the ECT limits climate action. Nathalie Bernasconi-Osterwalder, who is an international lawyer and heads the Economic Law & Policy program of the International Institute on Sustainable Development, argues that the "ECT attracted little public attention as a legal instrument and remains largely unknown."[105] In a 2018 report, the Corporate Europe Observatory and the Transnational Institute described the ECT as "The One Treaty to Rule Them All," which would "allow[] corporations to sue governments and has been responsible for multi-million dollar payouts of

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102. Edna Sussman, *The Energy Charter Treaty's Investor Protection Provisions: Potential to Foster Solutions to Global Warming and Promote Sustainable Development*, *in* SUSTAINABLE DEVELOPMENT IN WORLD INVESTMENT LAW 513, 517 (Marie-Claire Cordonier Segger, Markus W. Gehring, Andrew Paul Newcombe eds., 2011), https://books.google.com/books?id=6j45H_rTFYAC&printsec=frontcover#v=onepage&q&f=false [https://perma.cc/5SUM-X97R].

103. ENERGY CHARTER TREATY, *supra* note 90.

104. Selivanova, *supra* note 93. Selivanova explains the rule of the ECT in applying energy specific rules:

> While the WTO agreements do not provide for specific rules on trade in energy, there are some distinctive features of the energy sector, where more energy-specific rules may be needed. Problems related to the existence of quantitative restrictions, transportation and access to pipeline networks, public service obligations, environment and climate change all have implications for energy production and trade and deserve consideration.

Id.

105. Nathalie Bernasconi-Osterwalder, *How the Energy Charter Treaty Could Have Costly Consequences for Governments and Climate Action*, INTERNATIONAL INSTITUTE OF SUSTAINABLE DEVELOPMENT, https://www.iisd.org/library/how-energy-charter-treaty-could-have-costly-consequences-governments-and-climate-action [https://perma.cc/9WTX-JAYQ].

taxpayers' money to energy firms."[106] The Corporate Europe Observatory and the Transnational Institute report argues that the ECT "can be used to lock countries into the use of climate-wrecking fossil fuels, shield disastrous energy projects from public opposition, and cement the power of big business over our energy systems."[107] The report further warns that the ECT "is in the process of expansion, threatening to bind even more countries to corporate-friendly energy policies."[108] The Paris Agreement, however, serves as a counterweight as well as a complementary instrument to the ECT. The next subsection considers the legal mechanisms of the Paris Agreement for the more widespread deployment of renewables.

B. Paris Agreement

> *Investment agreements have been designed primarily to protect the status quo. Conversely, compliance with the objectives of the Paris Agreement will require radical change: a future in which governments have met the collective goal of keeping below the 2°C guardrail is a future without fossil fuels.*
>
> – Kyla Tienhaara, Australian National University[109]

> *Climate action is not a burden, but an unprecedented opportunity. Decreasing our dependence on fossil fuels will build more inclusive and robust economies. It will save millions of lives and slash the huge healthcare cost of pollution.*
>
> – Erik Solheim, Head of UN Environment Programme (UNEP)[110]

The Paris Agreement is not precisely a treaty, but is instead built upon an existing treaty developed in 1992: the United Nations Framework Convention on Climate Change (UNFCCC).[111] Key elements of the Paris

106. Corporate Europe Observatory (CEO) and the Transnational Institute (TNI), *The One Treaty to Rule Them All: The ever-expanding Energy Charter Treaty and the power it gives corporations to halt the energy transition* (2018), https://www.tni.org/files/publication-downloads/one_treaty_to_ruled_them_all.pdf [https://perma.cc/Q9TE-AHFZ].

107. *Id.*

108. *Id*. at 10.

109. Kyla Tienhaara, *Regulatory Chill in a Warming World: The Threat to Climate Policy Posed by Investor-State Dispute Settlement,* 3 TRANS ENVTL. LAW 229, 250 (2017).

110. Manuel Elias, *US decision to withdraw from Paris climate accord a 'major disappointment' – UN*, UN NEWS (June 1, 2017), https://news.un.org/en/story/2017/06/558562-us-decision-withdraw-paris-climate-accord-major-disappointment-un [https://perma.cc/MS47-AHC9].

111. James Zimmer, *Pulling Out of Paris and Following Connecticut: Aggressive State Energy Policy in the Trump Era*, 34 CONN. J. INT'L L. 255, 258 (2019). "For years the United Nations General Assembly had expressed concern over the deteriorating condition of the environment. Having found success addressing the depletion of the ozone with the Montreal Protocol, the U.N. turned its attention to the matter of climate change. The UNFCCC was the result of those efforts." *Id.*

Agreement[112] include: providing and establishing progressively ambitious, nationally determined contributions in five-year increments.[113] Environmental law scholar Elizabeth Burleson notes, "[t]he requisite funding and the facilitative nature of five-year review/stock taking cycles remain broad brush rather than clearly defined, yet a transparency framework is expected to help ratchet up implementation."[114] At the core of the Agreement, parties will submit their updated plans, called Nationally Determined Contributions (NDC's), every five years in a process that seeks to ratchet up climate ambition.[115] Not only governments, but also many corporations supported the Paris Agreement by publicly calling on the United States and other countries to create a clear and lasting climate change solution.[116] U.S.

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112. Conference of the Parties' Twenty-first Session, U.N. Framework Convention on Climate Change, *Paris Agreement*, U.N. Doc. FCCC/CP/2015/L.9/Rev.1, Dec. 12, 2015 [hereinafter the *Paris Agreement*]. The *Paris Agreement* went into effect on Nov. 4, 2016. *See also Paris Agreement*, UNITED NATIONS CLIMATE CHANGE, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement [https://perma.cc/VC9C-SYTC] (last visited Jan. 31, 2020).

113. *See Paris Agreement*, art. 14, *supra* note 112.

114. Elizabeth Burleson, *Climate-Energy Sinks and Sources: Paris Agreement & Dynamic Federalism*, 28 FORDHAM ENVTL. L. REV. 1, 3 (2016). "Parties have set a long-term trajectory through national climate action plans and are coordinating peaking emissions as soon as possible. The Paris Agreement sets forth the principle that future national plans will be no less ambitious than existing ones. The 188 climate action plans submitted to date serve as a foundation for higher ambition." *Id.*

115. *Id.*

116. Uma Outka, *"100 Percent Renewable": Company Pledges and State Energy Law*, 2019 UTAH L. REV. 661, 674–75 2019. Outka states:

> Many of the companies that supported the Clean Power Plan and the Paris Agreement are now trying to send the message "We Are Still In" with the rest of the world. The "We Are Still In" Coalition represents a noteworthy, mixed coalition that includes states, local governments, investors, and companies that have pledged to operate on renewable energy.
>
> Beyond environmental- and public-image reasons to pursue clean energy, however, is a clear and overarching motivation to save money on electricity and mitigate risks. For some, undoubtedly, this is *the* motivation, with an improved public image a nice secondary benefit. The cost of wind and solar power has dropped significantly in recent years, and long-term renewable energy contracts can stabilize cost predictability into the future. Google explains its 100 percent renewable goal by citing both a desire to reduce greenhouse gas emissions as "part of the solution to solving global climate change" and an interest in the insulation from "fuel-price volatility" renewable energy can provide, given that wind and solar fuel inputs are "essentially free." The global manager of renewable energy for GM, which has pledged to operate all its facilities with clean power by 2050, characterized the goal as "primarily all driven off economics," based on "[w]ind

leadership on climate change adaptation was crucial for the success of the Paris Agreement. In the absence of federal government leadership, individual states and transnational corporations have worked towards achieving renewable energy targets and emissions reductions. Law professor Uma Outka observes, "This context of federal policy reversal creates an environment in which companies' counterposing renewable energy goals stand out."[117]

In November 2016, the United States issued a document titled United States Mid-Century Strategy for Deep Decarbonization with the objective to build a low-emission economic system to reduce climate change.[118] Since taking office, President Donald Trump "has undone many of President Barack Obama's environmental initiatives, withdrawing the U.S. from the Paris climate agreement, rolling back regulations like the Clean Power Plan and most recently ending California's authority to set its own stricter fuel emission standards."[119] The head of the U.N. Environment Programme (UNEP), Erik Solheim, has said, "the U.S. decision to leave the Paris Agreement in no way brings an end to this unstoppable effort."[120] Solheim

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> and solar costs . . . coming down so fast." As it pursues two new Texas wind-farm deals, GM reports it is already realizing worldwide savings of $5 million per year.

Id.

117. *Id.*

118. Bob Lambrechts, *Navigating the Change in Climate Change Regulation in Kansas and Beyond*, J. KAN. B. ASS'N, Apr. 2017, at 42, 44. "The United States' plans for decarbonization by mid-century were released at the November 2016 United Nations climate summit in Marrakesh and built upon the pledge the United States made in the run-up to the Paris deal to cut its emission levels by as much as 28 percent by 2025, from 2005 levels." *Id.*

119. Emily Tillett, *Trump drops by United Nations climate summit*, CBS NEWS (Sept. 13, 2019), https://www.cbsnews.com/news/un-climate-summit-trump-drops-by-climate-meeting-at-start-of-united-nations-general-assembly [https://perma.cc/7P7Q-5LPT]. "Under the terms of the Paris agreement, the U.S. withdrawal will not be final until November 4, 2020, the day after the U.S. presidential election." *Id.*

120. UN NEWS, *supra* note 110. "UN China, India, the European Union and others are already showing strong leadership. Indeed, 190 nations are showing strong determination to work with them to protect this and future generations. The science on climate change is perfectly clear: we need more action, not less. This a global challenge. Every nation has a responsibility to act and to act now," said Solheim, who "underscored the momentum on climate action and a single political decision will not derail this unparalleled effort." He added:

> Committing to climate action means helping countries like Iraq and Somalia on the front line of extremism and terrorism. It means helping coastal communities from Louisiana to the Solomon Islands," explained Mr. Solheim, adding that it also means protecting food security and building stability to avoid adding yet more refugees to what is already an unprecedented global humanitarian crisis.

Id.

added, "The success of the Paris Agreement is in the achievement of the inherent synergy of [three] pillars": diplomatic, legal, and economic.[121]

Investments in transmission grids and electrification will lead to more opportunities to include renewables. Attorney Ryan Suit notes, "Investment into those projects would improve renewable energy technology, and renewable resources such as wind and solar power would become increasingly viable."[122] "The capital intensive nature of renewable power generation technologies and the fact that fuel costs are low, or often zero" is considered with "the weighted average cost of capital . . . used to evaluate the project" and its impact. [123]

IV. POST-PARIS ENERGY TRANSITIONS

No coincidence that the preparatory meetings for IRENA occurred following the Global Financial Crisis of 2008, which precipitated the Arab Spring of late 2010.[124] The pounding of protests and the unnerving possibility

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121. Rafael Leal-Arcas & Antonio Morelli, *The Resilience of the Paris Agreement: Negotiating and Implementing the Climate Regime*, 31:1 GEO. ENVTL. L. REV. 1, 4 (2018). Leal-Arcas and Morelli argue that the dismantling of the Paris Agreement will be difficult:

> The diplomatic pillar is the evolution of climate diplomacy, from a top-down to a bottom-up approach, which enabled the first global, legally binding climate deal to be achieved. The legal pillar consists of new legal strategies embedded in the Paris Agreement, including a combination of hard and soft law and compliance mechanisms. The economic pillar reflects the economic dynamics surrounding the Paris Agreement, including non-state actors' influences such as corporate strategies and consumer preferences. As a result of the alignment of the three pillars, dismantling the deal will be hard to achieve. Indeed, the success of the deal lies in the achievement of an inherent synergy of such pillars in climate action. In other words, dismantling the Paris Agreement will be hard and disfavored by diplomats, international lawyers, and business persons, who serve as the guardians of each pillar respectively.

Id.

122. Ryan Suit, *Charging Forward with NERC: An International Approach to Solving North America's Grid Problem,* 24:2 RICH. J.L. & TECH. 3, 36 (2018).

123. Ben N. Reiter, *Blowing It: Why Is Wyoming Failing to Develop Wind Energy Projects?*, 19 WYO. L. REV. 45, 85 (2019) (citing IRENA, Renewable Energy Technologies: Cost Analysis Series 3 (June 2012), https://www.irena.org/documentdownloads/publications/re_technologies_cost_analysis-wind_power.pdf [https://perma.cc/PEK5-4Z65]).

124. Urpelainen & Van de Graaf, *supra* note 18.

> Polls show that more than 63% of the population in Europe and North America saw climate change as a serious threat in 2007–2008 (Gallup 2011). The number dropped in both regions in subsequent years, possibly due to the global recession, confirming that 2008 represented a unique window of opportunity to set up an institution such as IRENA. In short, the swift birth of IRENA contrasts

of toppling monarchies were not a desert mirage. These threats to power had to be neatly in the rearview. The Middle East drillers needed enough development to put people at ease, not enough to sway the balance of power. IRENA was simultaneously the aspiration of the Global South to answer for the insurgent extractive capitalism, which powered the Global North. People turned their noses on Doha, Qatar for its high per capita use of energy, but ignored the per capita use of energy in placed like Houston, Miami, or Los Angeles. A new movement was afoot, and the United States became more and more irrelevant in the climate change conversation.[125]

When I first attended the IRENA Assembly in January of 2016 in Abu Dhabi, the jubilant air from the Paris Agreement persisted in the first major intergovernmental organization meeting. The crisp night air in the Financial Times program, featuring UN General Secretary Ban Ki-moon, IRENA Director General Adnan Amin, and UNFCCC Chair Christiana Figueres, was met with applause that the work of reconstructing/rebuilding or new construction would continue.[126]

The topics of discussion, which are still relevant today included:

- What are the approaches that will lead to more rapid and larger-scale deployment of renewables?
- What policies are needed from governments to scale up the penetration of renewables? Which policies are succeeding? Why?
- What are the greatest obstacles to accelerating the uptake of renewables? System costs, finance, or policy?
- What is the role of the private sector?
- How can commercial finance be scaled up to support a more rapid uptake of renewables? What are the innovations that will make this possible?
- What could a 100% renewable energy future look like?
- What are the experiences and lessons of pioneering companies, cities and regions that have embarked on the pathway or

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> markedly with the declining rate of multilateral innovation, both in global environmental governance and in world affairs more broadly. By proposing to set up an entirely new bureaucracy for renewable energy cooperation, Germany and its partners swam against the tide of declining multilateralism.

Id.

125. John Allen, *American climate leadership without American government*, PLANET POLICY (Dec. 14, 2018), https://www.brookings.edu/blog/planetpolicy/2018/12/14/american-climate-leadership-without-american-government/ [https://perma.cc/7LT6-DX9N].

126. *FT IRENA Question Time Debate 2016*, FIN. TIMES LIVE (Jan. 17, 2016) https://live.ft.com/Events/2016/FT-IRENA-Question-Time-Debate-2016 [https://perma.cc/6G4F-SEVW].

> actually achieved 100% renewable energy use? What are the challenges? What is the way to reach 100% renewables?[127]

The answer to the final question, how to reach 100 percent renewables, rests with IRENA through its coordinated information and policy network. Even with a small budget and technical mandate, IRENA is becoming a key player in energy governance.[128] Two of IRENA's accomplishments include the Global Atlas and the Renewables Readiness Assessment. These online tools work to democratize the process of obtaining energy access for regions and countries that may not have information tools to determine metrics.[129] The IRENA Global Atlas initiative seeks to narrow "the gap between countries that have access to the necessary data and expertise to evaluate the potential for renewable energy deployment in their countries and those that lack these elements."[130] The initiative is the result of a collaboration of more than 50 skilled international research institutions in the sharing of "over 2000 renewable energy maps on this single and consistent platform covering solar, wind, bioenergy, geothermal and marine energy."[131] Technology has also improved over time. For example in 2011, the wind and solar map had a spatial resolution of just 50 kilometers, but now the resolution has improved to 1 kilometer.[132] "3.0 is a complete reworking of the platform, that brings a collaborative dimension that people have become accustomed to on platforms like YouTube or WhatsApp," said Abdulmalik Oricha Ali, an IRENA Associate Programme Officer working on the Global Atlas.[133] "New analysis capabilities, a PV battery simulator, a solar water-heater simulator, and a grid-connected solar PV system simulator are all included in the updated tool."[134] In December

127. *Id.*
128. Urpelainen & Van de Graaf, *supra* note 18.
129. Nadia Ahmad, *Unearthing Clean Energy, TEDxOcala*, TEDXOCALA (Nov. 5, 2016), https://www.youtube.com/watch?v=QP39lio396s [https://perma.cc/2D3D-8H7K].
130. *Global Atlas*, IRENA, https://www.irena.org/globalatlas/ [https://perma.cc/6TSN-TG7Y] (last visited Feb. 27, 2020).
131. *Id.*
132. *IRENA Global Atlas 3.0: Resource Data for Renewable Energy Professionals*, IRENA (June 6, 2017), https://www.irena.org/newsroom/articles/2017/Jun/IRENA-Global-Atlas-30-Resource-data-for-renewable-energy-professionals [https://perma.cc/Z8RA-NB3D].
133. *Id.*
134. *Id.* "[M]aps now credit individual data providers by displaying the source very visibly on the interface." *Id.*

2016, IRENA added a bioenergy production simulator, which is integrated into the Global Atlas platform.[135]

IRENA's Renewables Readiness Assessment (RRA) is a tool for measuring the suitability of conditions in various nations for the development and deployment of renewable energy as wells as necessary conditions to achieve those results in the short- and medium-term.[136] The RRA is created as a country-led, collaborative instrument to widen the span of stakeholders under five main themes: "national energy policy and strategy; institutions and markets; resources and technologies; the establishment of a business model; and the capacity needed to scale-up renewables."[137] In the follow-up to the process, IRENA acts "as an interlocutor between development partners and countries in need of support, and to directly assist the implementation of RRA findings."[138] "The RRA can also assist in attracting funds and leveraging support, both from the international community and within implementing countries themselves."[139]

V. THE CORONAVIRUS RECOVERY AND ENERGY TRANSITIONS

The day before Earth Day 2020, the unimaginable happened. The price of oil was negative.[140] The analysts called it "off-the-charts wacky."[141] Oil producers were paying buyers to take the commodity off their hands for fear that storage capacity would run out by May 2020.[142] The coronavirus lockdowns dried up demand for oil as people remained indoors under quarantine and self-isolations through social distancing mandates.[143] Oil firms resorted to renting tankers in order to store excess supply that forced the price of U.S. oil into the negative range.[144] At one point, "the price of a barrel of West Texas Intermediate (WTI), the benchmark for US oil, fell

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135. *Id.*

136. *Renewable Readiness Assessment (RRA)*, IRENA, https://www.irena.org/rra [https://perma.cc/W93C-4MZG] (last visited Feb. 27, 2020).

137. *Id.* "While IRENA produces RRA reports to disseminate valuable country-level knowledge, the ultimate goals of the RRA process are to inspire new initiatives, refine policies and regulations to establish an enabling environment, and identify capacity-building measures and requirements." *Id.*

138. *Id.*

139. *Id.*

140. Matt Egan, *How negative oil prices could set the stage for the next price boom*, CNN (Apr. 23, 2020), https://www.cnn.com/2020/04/22/business/negative-oil-prices-spike/index.html [https://perma.cc/XZ73-7J57].

141. Andrew Walker, *US oil prices turn negative as demand dries up*, BBC (Apr. 21, 2020), https://www.bbc.com/news/business-52350082 [https://perma.cc/K3RQ-PQR7].

142. *Id.*

143. *Id.*

144. *Id.*

as low as minus $37.63 a barrel."[145] The correct policy response would have been to level up the transition to renewables instead of enhance price protections for fossil fuels as the United States federal government did.

Meanwhile, in Abu Dhabi, IRENA was focusing on aligning the COVID-19 recovery efforts with the ideas behind the Paris Agreement and the 2030 Agenda for Sustainable Development.[146] The sharp contrast between the American and IRENA responses to energy shocks was telltale of the future of energy transitions and how far behind the curve we are and will remain to be. The coronavirus recovery highlighted the difference between energy regime complexes. IRENA recommended policy proposals to mobilize resources and increase international cooperation.[147] The coronavirus recovery response, the IRENA coalition recommended, should reconsider the deadlines for renewable energy projects facing near-term obligations, list the renewable energy industry and related infrastructure as critical infrastructure, and extend renewable energy solutions – both centralized and decentralized.[148] As governments consider their stimulus packages for a rapid economic recovery, the IRENA Coalition for Action members recommended the prioritization of renewable energy to phase out fossil fuel development, availability of public financial support to improve the mobilization of private investment in renewables, enhancing the role of renewable in industrial policy and growth, revisions to labor and educational initiatives to forward a just transition and allow for a shift for renewable energy jobs, and finally a strengthening of international cooperation for acceleration of the renewables transition.[149]

COVID-19 has strained national budgets as short to medium-term energy access investment may appear to be a lower priority for governments.[150] At the same time, underinvestment could drastically limit the capacity of rural health centers to support front-line health workers as well as essential services to COVID-19 patients.[151] When a vaccine is available, cold storage

145. *Id.*
146. *IRENA's Coalition for Action Calls for Green Recovery Based on Renewables*, IRENA (Apr. 28, 2020), https://irena.org/newsroom/articles/2020/Apr/IRENAs-Coalition-for-Action-calls-for-Green-Recovery-Based-on-Renewables [https://perma.cc/ZFV9-BA92].
147. *Id.*
148. *FT IRENA Question Time Debate 2016*, *supra* note 126.
149. *Id.*
150. IRENA, *Francesco La Camera Appointed as New IRENA Director-General* (Jan. 13, 2019), https://www.irena.org/newsroom/pressreleases/2019/Jan/Francesco-La-Camera-appointed-as-new-IRENA-Director-General [https://perma.cc/4QQB-YBKK].
151. *Id.*

and refrigerated transport across large areas will be crucial.[152] Decentralized renewable energy technologies such as solar will be key for large-scale immunization efforts in developing countries.[153] More so, stagnant progresses in mainstreaming clean cooking solutions will become increase risk factors for exposure to particulates and COVID-19.[154]

CONCLUSION

Former IRENA Director General Adnan Amin praised the electricity sector shift for renewables, arguing that the shift has become "unstoppable."[155] He added, "Globally, more renewable energy capacity has been installed than new fossil fuel and nuclear capacity combined, for four years running."[156] Under the leadership of current IRENA Director General Francesco La Camera, membership for IRENA is approaching near-universality.[157] As economies seek to recover from massive unemployment resulting from the coronavirus pandemic, a climate-centered recovery response has been gaining more traction. Not only are countries seeking to rebuild, they want to build better and not only build back. All recent major models of the future energy system from IRENA show Europe running on between 80-100% renewable energy in 2050.[158] Even the International Energy Agency predicts higher use of renewables which it as long used modelling that underestimates renewable markets, with conservative estimates.[159] In other parts of the world, the future share of renewables is anticipated to be well above 50-60%, as deployments increase.[160] The European Commission recommends a two-track approach to realize the more aggressive renewable energy targets.[161] Most importantly, established renewables like wind power and solar will produce the majority of low-cost, emissions-free energy.[162] Alongside those established renewables, the

152. *Id.*
153. *Id.*
154. Scientists are already investigating links between air pollution and higher levels of coronavirus mortality, with preliminary results showing a probable correlation between the two.
155. Amin, *supra* note 1.
156. *Id*. "Some 181 GW of new renewables capacity was installed in 2018; it now makes up more than one-third of global installed power capacity." *Id.*
157. IRENA, *Francesco La Camera*, *supra* note 150.
158. Rémi Gruet, '*Recovery packages must make clean-energy a cornerstone of the new global economy'*, RECHARGE (May 11, 2020), https://www.rechargenews.com/ circuit/ recovery-packages-must-make-clean-energy-a-cornerstone-of-the-new-global-economy/2-1-805945 [https://perma.cc/BZ79-EM68].
159. *Id.*
160. *Id.*
161. *Id.*
162. *Id.*

second-generation of renewables, such as wave, tidal and OTEC (ocean thermal energy conversion) or SWAC (sea water air conditioning) should also be deployed at a larger scale.[163] Amidst the carnage of the coronavirus, it is possible to imagine a new world for renewables. Looking back at this moment, history will judge us for taking decisive action to halt climate change impacts or for doing nothing and ignoring the lessons of inaction.

163. *Id.*