2 Between Pushback and Collaboration

The Oil Industry and the Challenges of Environmentalism and Resource Scarcity, 1970s–1980s

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Introduction

In December 1974, Robert O. Anderson, the chairman and CEO of the oil company Atlantic Richfield Co. (ARCO), wrote a fifty-five-page long paper about "The Global Dilemma," which he saw in three central "problem areas": capital, food, and resources. The demise of the Bretton Woods system, the challenge of feeding a growing world population, and the limited availability of natural resources coupled with environmental pollution made him deeply concerned about the future. Anderson was particularly worried about energy supply:

> Until quite recently, the entire petroleum industry felt the energy future of the globe was quite secure, was at least tenable. The potential supplies available throughout the world appeared to meet estimated demand curves through the end of this century and hopefully by that time our nuclear energy program would be well into an advanced stage.[1]

This paper, written by Anderson as a basis for discussion in philanthropic and political circles, reveals the multitude of concerns in his thinking about the future. Anderson was not only a leader of the oil industry, but also chairman of the Aspen Institute for Humanistic Studies, a confidant of US President Nixon, and among a group of "oilmen" who shaped global environmental governance in the 1970s.[2]

At the time, the world of oil was in turmoil. In October of 1973, the Arab members of the Organization of Petroleum Exporting Countries (OPEC), separately organized as OAPEC, issued their famous oil embargo, which is often associated with the "oil crisis." The embargo, however, did not quite stop the flow of oil to the West, and the spectacular price increases of 1973–1974 were rather caused by separate announcements of production cuts by OPEC members.[3] The perceived oil crisis was in most instances an expectation of a potential supply issue, rather than a prolonged shortage, as the perceived threat of tightening supplies

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drove a rush on the market. Still, there was undoubtedly a shock in the world of oil, as Anderson recognized, and previously optimistic expectations of the future of oil-based growth were widely questioned. Oil had been the essential energy source of economic growth in the postwar years. Nevertheless, OPEC countries of the Global South, which contained the largest and most profitable oil reservoirs, were able to seize control over crude oil pricing, demand higher shares of the profits, and expropriated oil production infrastructures within their borders.[4] At the same time, a debate about resource scarcity stoked by the 1972 study *Limits to Growth*, the critique of environmentalism, and the emergence of environmental institutions imposed new boundaries for oil companies.[5] Global environmental governance, however, was also shaped by oil actors. This was particularly the case with Anderson's friend and ally, the Canadian oil manager Maurice F. Strong, who chaired the UN Conference on the Human Environment (UNCHE) in Stockholm in 1972 and became the founding director of the UN Environment Programme (UNEP).[6]

Why did oil executives like Anderson and Strong engage with the challenges of environmentalism and resource scarcity? How did they influence environmental governance and management? And how did major oil companies and their executives react to the same situations? The relationship of oil companies with the environmental challenge of the 1970s can be understood as one of pushback and collaboration. On the one hand, they pushed back against environmentalist critiques and restrictive regulation that threatened their business interests. On the other hand, these companies—especially some individual executives—also collaborated in environmental matters by shaping environmental governance, addressing pollution problems, and investing in alternative energy.

This chapter examines how oil companies and executives dealt with the emerging environmentalist demands and the question of potential limits to the global availability of oil. The first part will focus on a group of a few influential oilmen around Robert Anderson and Maurice Strong, who promoted environmentalism and shaped seminal events and leading organizations, notably the agenda for the 1972 Stockholm Conference. They also helped create organizations and institutions that prioritized the role of business in environmental management instead of restrictive regulations, but also raised awareness of environmental problems such as global warming. The second part discusses the role of oil companies more broadly and examines how they addressed environmental challenges both by pushing back against regulation, but also by collaborating and addressing atmospheric pollution challenges. Oil companies engaged with the 1972 *Limits to Growth* report and prepared for the prospect of oil becoming scarce by investing in alternative energy technologies. This chapter will conclude with a discussion of the 1986 counter-shock, when oil prices crashed, and how it became a turning point in the oil industry's involvement in alternative energy and its position toward environmental problems.

Building on the available archival evidence of key actors and companies—especially the personal papers of Maurice Strong, Joseph E. Slater, and Constantinos Doxiadis, as well as on oil industry records in various corporate and personal archives—this chapter offers new insights into the relationship of the oil industry with the environment. Previous studies of the emergence of global environmental governance have noted the role of business and particularly oil actors Robert Anderson and Maurice Strong, but offered limited insights into their motivations, the organizations and alliances they built, and the context of their continued oil industry involvement.[7] These aspects are analyzed in this chapter, which thereby challenges previous interpretations that have considered business engagement with environmental governance primarily as a corporate lobbying effort. Anderson and Strong went beyond protecting business interests in their engagement, gained the trust and respect of environmental leaders, and even alienated some of their business allies. Moreover, important parts of the corporate world did not unilaterally reject the notion of "limits to growth."[8] The report and the debate about resource limits were actually embraced by oil companies and executives, many of whom expected an impending oil scarcity and invested in alternative energy.

As will be shown, the oil industry of the 1970s was very different from the one we know today. Since the late 1980s, Big Oil has become notorious for maintaining the "fossil" status quo, its greenwashing campaigns, empty net-zero pledges, opposition to government action to reduce greenhouse gas emissions, and not least its support for climate denialist networks, as a number of journalists, scholars, and activists have uncovered in recent years.[9] In light of the evidence of oil actors and companies engaging with environmentalism and alternative energy in the 1970s, while also refraining from climate denialist campaigns before the late 1980s, it is necessary to nuance the currently dominant narrative of the historical oil industry as climate denialist. We need to recognize turning points in the history of business and environment, since oil industry positions and circumstances (and surely those of other industries too) have not remained static, and there was no linear progression from early climate knowledge to denialism either. Rather, they evolved over time. While there is no reason to vindicate the greenwashing of oil companies or distract from the environmental harm they have evidently caused, it is necessary to recognize the complexity of the environmental history of the oil industry.[10] After all, the latter underwent a fundamental transformation in the 1970s, when oilmen promoted environmentalism and prepared for a future beyond oil, only to backtrack from these positions in the late 1980s.[11]

Oilmen Shaping Environmental Governance: From Aspen to Stockholm and Beyond

In November 1969, Robert O. Anderson of ARCO was invited to speak at the UNESCO conference "Man and Environment: A View towards Survival" in

San Francisco. In his talk, Anderson presented himself as a representative of the business world who found it essential to put an end to environmental degradation and argued for a new balance between humans and the natural environment.[12] This unusual move for an oil executive might raise suspicions today, and certainly also did in 1969. After all, Anderson had spent most of his life drilling, refining, and selling petroleum. The son of a Chicago banker and oil financier, Anderson built an oil empire based on a series of mergers that culminated in the formation of ARCO in 1965. His business interests also included banking (he was a director at the Chase Manhattan Bank) and ranching in Texas and New Mexico, which made him one of the biggest cattle herders and the largest individual landowner in the United States.[13] While he was a nature lover, Anderson cannot be described as an environmentalist by conviction. Rather, he was a pragmatic businessman and philanthropist who recognized the nascent importance of environmental issues in society and that the corporate world had to contribute to finding solutions. In his 1969 speech, he acknowledged that "private industry," along with consumers, was responsible for environmental pollution and "must bear the full share of the burden in repairing the damage and maintaining the balance of nature."[14]

At the heart of Anderson's philanthropic empire stood the Aspen Institute for Humanistic Studies, which had traditionally organized *humanistic* summer retreats for business executives to read works like *Plato's Republic* and discuss pressing societal issues.[15] Anderson's most important ally in running this institute was Joseph E. Slater, who had in the 1950s worked as the chief economist at Creole Petroleum in Venezuela, which was at the time the world's largest crude oil producer and owned by Standard Oil of New Jersey. Slater had gone on to become a manger of philanthropic organizations, first with the Creole Foundation, then the Ford Foundation, followed by the Salk Institute, and from 1969 the Aspen Institute. Together with Anderson, Slater transformed the Aspen Institute from an executives' summer school into a more policy-oriented organization, which put the natural environment on the agenda.[16]

Initially, the Aspen Institute cooperated with David R. Brower, one of the most prominent environmental campaigners of the United States. He directed the John Muir Institute for Environmental Studies (JMI), which received substantial contributions from the Aspen Institute and organized a joint conference about "Progress in a Living Environment" in 1969.[17] Little later, however, the Aspen Institute shifted its focus to global questions of environmental organization and instead partnered with Thomas Wilson, who had worked on international environmental matters at the US State Department. The other important partner became Maurice Strong, who like Anderson had spent most of his career in the oil industry, holding leading positions with Canadian companies like Dome Petroleum and the Power Corporation. In 1966, he started a second career in environmental and development diplomacy and ended up being appointed to prepare and chair the 1972 UNCHE in Stockholm.[18] Like Anderson, Strong was

not known for being overly environmentalist in his convictions, even though he was a board member of leading conservation organizations like the World Wildlife Fund and the International Union for Conservation of Nature and Natural Resources (IUCN) in the 1970s. He considered pollution as a convenient international problem and a unique opportunity to revive the struggling United Nations, or a "cure" for the "sick man," as he put it when accepting the UNCHE assignment in 1970.[19] Slater had known both Wilson and Strong from earlier work with the Ford Foundation and included them in the Aspen initiative to aid the debate about international environmental organization.[20] Backed by a grant from the Anderson Foundation, Wilson produced a global environmental survey that recommended the creation of a small NGO to "stimulate, synthesize, and communicate" information and opinions about the "environmental crisis." As a result, the Aspen Institute set up an affiliated organization in 1971, the International Institute for Environmental Affairs (IIEA), initially financed entirely by Anderson's personal foundation.[21]

The year before the Stockholm Conference was very busy for the small, yet well-connected IIEA, managed by Thomas Wilson and former *New York Times* correspondent Jack Raymond as its CEO.[22] IIEA established its offices across the street from the UN headquarters in New York City,[23] and worked closely with Strong, who—given the limited UN funding and manpower—gladly enlisted the institute's services.[24] In the summer of 1971, IIEA organized the workshop "International Management of Environmental Problems" at the Aspen Institute, which assembled fifty-five international experts over seven weeks. It explored the organizational implications of international environmental problems in preparation for the Stockholm Conference,[25] and concluded with recommendations to the Conference Secretariat.[26] In the same year, IIEA recruited a worldwide set of board members, published a regular *World Environment Newsletter*, and coordinated the publication of *Only One Earth*. This was a report commissioned by Strong and written by Barbara Ward and René Dubos with the input of 152 consultants from 58 countries.[27]

In preparation for Stockholm, IIEA also engaged with the business world. On 21 February 1972, IIEA and the International Chamber of Commerce (ICC) hosted a "private briefing for world business leaders" at the ICC headquarters in Paris with Strong and 150 international business leaders.[28] IIEA also used the occasion of the ICC briefing in Paris for its first international board meeting. In May, IIEA then organized a second briefing for business leaders with Strong in New York City,[29] and in the run-up to Stockholm, Strong would also meet with countless other business organizations.[30] Anderson's vision for IIEA was, after all, to "steer a steady mid-course between doom and gloom alarmists and those who resist acknowledging the clear danger," and in order for that to happen, the business world needed to have a seat at the table. In other words, industry should acknowledge and "manage" the environmental problem (rather than be faced with restrictive government regulation).[31]

Just before the Stockholm Conference, the ICC organized a pre-conference of business actors at Gothenburg. While the IIEA did not participate in the organization of this conference (and only Raymond attended it), they still took credit for having initiated the environmental debate in the business world, as it was "one of the constructive responses to emerge from the World Business Leaders Briefings" convened by the IIEA.[32] That meeting was to a considerable extent facilitated by John G. Welles, an economist and specialist on oil and gas at the University of Denver's Research Institute, who worked closely with Strong in organizing meetings with the business world prior to Stockholm. Strong did not attend the Gothenburg meeting, but stated that he would be represented by Welles, "one of my close collaborators in preparing the Stockholm Conference."[33] While the business community turned out to be marginalized in Stockholm,[34] the Gothenburg meeting and its official conclusions allowed it to emphasize its priorities at the start of the UNCHE.[35]

In June of 1972, Anderson flew from New York to Stockholm in his private jet to attend the UNCHE, accompanied by Slater.[36] While discouraged by the limited interest in finding solutions in dialogue with industry, Anderson saw the UNCHE as a success in fostering international cooperation on environmental matters. After the conference, Strong thanked Anderson for the IIEA's "extremely valuable contribution" and requested IIEA to help set up and recruit staff for the new UN institution under preparation.[37] In July 1972, Anderson, Slater, and Barbara Ward also attended the Delos symposium of the Greek architect and urban planning guru Constantinos Doxiadis, a board member of IIEA, with discussions about human settlements, environmental problems, and the results of the Stockholm Conference with other participants, including anthropologist Margaret Mead and futurists Buckminster Fuller and Herbert Kahn.[38] The creation of a specialized UN agency under Strong convinced Anderson and his partners that IIEA would be most useful as an international, and not US-based, organization. Anderson therefore offered IIEA leadership to Barbara Ward, along with the promise of continued funding.[39] Ward accepted on the condition of moving the institute to London and assembling her own staff, and headed the organization with a new emphasis on development as the International Institute for Environment and Development (IIED).[40] In the meantime, Strong continued the cooperation with Anderson and the Aspen Institute as founding director of UNEP. In August of 1973, IIEA organized a six-day "consultation" for Strong and UNEP at the Aspen Institute about the "outer limits" to human activity, intended to bring the new agency up to date on critical issues by consulting with twenty-five leading international scientists on resource depletion, population growth, and environmental pollution.[41]

Throughout the 1970s and into the 1980s, Anderson and Strong maintained a wide network that brought together businessmen, bureaucrats, scientists, environmental experts, and representatives of international organizations. The Aspen Institute continued its development of policy-oriented programs alongside the

executive seminars, and, among other themes, organized programs on energy, environment, and climate change. The activities were largely financed by Anderson and other corporate donors—notably oil companies—managed by Slater, and also shaped by Strong, who served on the institute's Board of Trustees, and provided a venue for events at his ranch at Baca, Colorado. The "Aspen family," as it was called, included many more oil executives: Gulf Oil chairman Jerry McAfee, Mobil director and diplomat George McGhee, Texan oil and gas tycoon George P. Mitchell, Exxon Vice-President Jack Clarke, VOLVO chairman Pehr Gyllenhammar (a company that established an oil subsidiary), as well as ARCO economists Waldemar Nielsen, David Sternlight, William Kieschnick, and Anderson's right hand at ARCO, president and former Harvard Business School professor Thornton Bradshaw.[42]

Through those Aspen collaborations and relations with UNEP, the Anderson-Strong network helped shape global environmental governance. At UNEP, Strong built up a seminar program of cooperation with industry on environmental issues.[43] Anderson and Strong also maintained close ties with the Club of Rome (CoR), the International Federation of Advanced Study (IFIAS), and the Geneva-based Centre d'Etudes Industrielles (CEI, or Center for the Education in International Management). As board members of the CEI Foundation, Anderson and Strong shaped the center's agenda for environmental questions and its initiative to facilitate exchanges between government and industry representatives, such as the International Environmental Management Seminar in January 1975.[44] In those exchanges with the business world, and as the head of UNEP, Strong particularly promoted the concept of *environmental management* as a business-inspired approach to dealing with environmental issues in corporations, government, and international organizations alike.[45]

Anderson's central role in the relationship of business and environmental governance can particularly be seen in his involvement in the World Industry Conference on Environmental Management (WICEM) in Versailles in 1984. After Strong left UNEP, his successor Mustafa Tolba had continued cooperations with industry in environmental matters and relied on the ICC to organize conferences.[46] For the planned conference in Versailles, Anderson decided to host a special workshop at Aspen and submitted a nine-point program to the organizing committee, which it adopted.[47] In Versailles, Anderson was invited as a keynote speaker and praised the conference for finally bringing industry, government, and environmental organizations together in dialogue, as he had envisioned for the Stockholm Conference. "Industry and government need not be at loggerheads," he stated and argued for voluntary environmental management and innovation by industry itself, rather than restrictive regulation by governments. This episode shows how Anderson, Strong, and their allies were quite successful in gathering environmental activists, scientists, and diplomats in Aspen, channeling oil money toward environmental research and organizations, and thereby shaping global environmental governance as well as research and institutions.

What Anderson and his allies wanted was a global environmental governance that takes into account and protects the basic needs and interests of the business world. This meant that they preferred corporate initiatives and environmental management over restrictive regulation that might hamper multinational and especially extractive industries.

At the same time, though, Anderson and Strong remained in the oil business. Anderson's biggest coup as an oilman was developing the giant oil field at Prudhoe Bay in Alaska, which ARCO discovered in 1968.[48] To transport the Arctic oil to refineries, ARCO and partners planned the highly controversial Trans-Alaskan Pipeline, which brought Anderson into direct conflict with environmental organizations.[49] Anderson won the battle and the pipeline was eventually authorized during the oil price crisis by President Nixon, with whom Anderson maintained close relations, and built by 1977.[50] Maurice Strong returned to the oil industry after leaving UNEP. From 1976 to 1977, he headed Petro-Canada, a national oil company to develop new oil and gas resources. In that context, Anderson and Strong also made a business deal as Petro-Canada acquired ARCO's Canadian subsidiary ARCAN.[51] While Strong frequently emphasized that he would not give up his environmental ideals, in reality Petro-Canada did not stick out as a particularly environmentally friendly oil company. It hired environmental managers and followed existing regulations, but was involved in some of the riskiest and most polluting oil developments in Canada's seas and wilderness: the Albertan tar sands, offshore, and in the Arctic.[52] Thereby, Strong switched sides and from 1976 also represented Petro-Canada at the International Petroleum Industry Environmental Conservation Association (IPIECA), which had been established to facilitate a dialogue with UNEP.[53] Strong's and Anderson's engagement with environmentalism and environmental governance, however, should not be dismissed as a conspiracy to take the wind out of the sails of the environmental movement and make sure its governance would not hurt business. They did aim at protecting the interests of the business world by arguing for a dialogue between environmentalists, governments, and polluters, and for industry to *manage* the environment instead of restrictive government regulation. Yet this does not mean they were not genuinely concerned about environmental problems and considered changes to address them as inevitable, not least to maintain a stable social, economic, and thereby "business environment."

Oil Companies, Environmentalism, and Energy Transitions: Managing Scarcity and Sustainability

Around 1970, the oil industry generally faced a more critical public on environmental issues. The landmark events of the era that impacted the public image of oil companies were tanker accidents like the one at Torrey Canyon in 1967 or the Santa Barbara oil spill of 1969. Besides marine oil spills, airborne pollutants released from refineries and the combustion of oil and gas products—carbon,

sulfur, nitrogen, lead—were diagnosed as harmful to humans, plants, animals, and the balance of the world's climate. Environmental pollution had of course existed before, and the oil industry had developed technological solutions to reduce it and thereby also increase production efficiency.[54] With the emergence of environmentalism and the formation of a popular movement, environmental issues were increasingly problematized as societal issues.[55] Oil companies generally saw themselves compelled to manage environmental problems more systematically and established environmental departments, which served to comply with regulations such as environmental impact studies, to provide industrial expertise for planned legislation, but also to find solutions to manage environmental problems.[56] Environmental management also became an essential part of corporate public relations, often criticized as *greenwashing*, even though not all marketing of oil companies was intended to deceive the public, as it also featured legitimate improvements such as increasing pipeline safety or reducing refinery emissions.[57]

In the 1970s and 1980s, oil companies both pushed back against environmentalist critiques and restrictive regulation, but at the same time also collaborated in addressing pollution problems. Particularly air pollution controversies compelled oil companies to reduce the harmful side-effects of fuel combustion, primarily through government regulation but in part also voluntarily. The use of (toxic) tetraethyl lead as an additive to motor gasoline, which had originally been introduced to prevent the knocking of engines, was generally phased out in the course of the 1970s and 1980s.[58] Similarly, the contents of sulfur in refined oil and gas products were reduced significantly to lower sulfur dioxide emissions that caused acid rain. In both cases, oil companies, together with other industries, generally retracted from their earlier opposition to scientific studies and policy proposals to diminish lead and sulfur emissions, and instead branded themselves as innovators who developed and implemented technological solutions like catalytic converters for automobiles and improved desulfurization processes in oil and gas refining.[59]

In the case of anthropogenic climate change due to the emission of carbon dioxide (as well as methane), the oil industry's position remained ambivalent in the 1970s. Oil companies were generally aware of the early science of global warming, with Exxon also creating a special climate research program in 1977. Already in the 1970s, several oil actors voiced skepticism about climate science and emphasized the uncertainties, but did not yet resorted to climate denialist campaigns as they would from the late 1980s.[60] Somewhat paradoxically, there were also oil actors who promoted climate science in the 1970s, as the Aspen Institute and particularly Strong and Anderson helped fund climate research and raised awareness of the science and issue of global warming. They did so by recruiting distinguished atmospheric scientist Walter Orr Roberts to lead a special program on Food, Climate, and the World's Future at the Aspen Institute from 1973.[61] This program helped increase knowledge about the growing

scientific consensus on global warming with business leaders as well as public and international organizations like UNEP. At the same time, it particularly propagated *adaptation* strategies in food production as a solution to dealing with the effects of a changing climate.[62] Owing to those science communication efforts, Anderson spoke quite frankly about the scientific consensus on global warming in 1980:

> Those working on it are unanimous—or as close to unanimous as scientists ever get—in their evaluation that we are moving toward a cycle of industrial dust, airborne particles and carbon dioxide that will create a major warming trend in the next forty or fifty years.[63]

In the 1970s, however, there was another potentially existential challenge in the eyes of oil executives: the question of resource scarcity. Many oilmen were fascinated and alarmed by the MIT modeling study *Limits to Growth*, commissioned by the CoR, which warned of a potential destabilization of industrial societies due to ecological limits if the growth trend remained unchanged.[64] Robert Anderson and Aspen Institute allies received a special briefing by the CoR and study authors in May of 1972. As an observer noted, Anderson was "ecstatic about the study and said it was something that could not be dismissed but either had to be disposed of or acted upon."[65] The Texan oil and gas tycoon George P. Mitchell, who in the 1990s became famous for commercializing "fracking," was so impressed by the *Limits to Growth* report that he invited study author Dennis Meadows to co-convene a series of conferences at his real estate complex called the "Woodlands" near Houston.[66] Mitchell and Meadows hosted three biannual conferences that brought together leading proponents and critics of the limits thesis, such as economist Julian Simon and biologist Paul Ehrlich.[67] Those events were organized in cooperation with the US Association of the Club of Rome, where Mitchell, Anderson, and several other oil executives associated with the Aspen Institute were members.[68]

The 1970s oil shocks presented both opportunities and challenges for oil companies. On the one hand, they faced supply shortages, expropriation in producer countries, and OPEC's price dictate, while oil companies also encountered public scrutiny over their environmental impact. On the other hand, the oil price crisis brought spectacular profits, which were invested in novel technologies and alternative energy solutions. From the mid-1960s, oil companies diversified into many other business sectors, as was common in large firms at the time, including transport, chemical industries, biotechnologies, computing, and in the 1970s particularly in alternative energy technologies.[69] There are many examples of oil companies pioneering alternative energy development. In geothermal energy, particularly the Union Oil Company of California created a consortium with two start-ups at The Geysers field near San Francisco in 1967. To expand geothermal steam production, Union Oil brought in its geologists, drilling, and reservoir

engineers, who developed techniques to extract the steam more efficiently and build the world's largest geothermal power plant complex.[70] Oil companies such as Gulf, Exxon, Mobil, and Shell entered the uranium exploration, nuclear fuel, and reactor technology business. They also promoted nuclear energy as an environmentally friendly technology of the future.[71] In solar energy, oil companies like Exxon, Mobil, BP, and ARCO were among the major investors in solar photovoltaic start-ups. Anderson's ARCO, for example, invested in Stanford Ovshinsky's Energy Conversion Devices (ECD) and Bill Yerkes' Solar Technology International (STI), and set up ARCO Solar to develop and produce photovoltaic technologies.[72] Exxon Research even provided the laboratory spaces for later Nobel laureate M. Stanley Whittingham to develop the rechargeable lithium-ion battery in 1977, which today serves electric automobility.[73]

The phenomenon of oil companies investing in alternative energy has been explained as a diversification of the business portfolio, or simply with conspiracy theories of Big Oil taking control of energy supply and hindering transition. This phenomenon, though, also has to be seen in the context of symbiotic relationships. For instance, oil companies could apply the same geoscientific exploration, oilwell rotary drilling, and reservoir engineering methods in geothermal energy.[74] It also has to be viewed in relation to expectations of conventional oil reserves running short before 2000 that motivated and legitimated alternative energy investments. Around 1970, as crude oil production in the United States and Venezuela decreased, oil companies became increasingly concerned about the future availability of oil, with most predictions assuming an eventual worldwide decline in conventional oil reserves toward 2000.[75] It was not that oil companies expected the world to simply run out of oil—there were still unexplored provinces and unconventional alternatives like shale oil—but that a peak in conventional crude oil production was inevitable if demand continued to grow. The scarcity consensus in the oil industry was captured by the Workshop on Alternative Energy Strategies (WAES) of MIT professor Carroll Wilson, who had longstanding relationships with Anderson and Strong, was an Executive Committee member of the CoR, and was also key to the making of the *Limits to Growth* study. From 1974 to 1977, Wilson's WAES brought together energy experts, managers, and planners from energy agencies and industries, particularly oil companies Shell, BP, ARCO, Statoil, and Petro-Canada. It explored six different scenarios that all diagnosed an oil shortage before 2000, and therefore recommended the immediate development of alternatives like nuclear and coal, as well as synthetic fuels and renewables in the long-term.[76] Those findings of an impending oil scarcity were then communicated by the companies involved, e.g. in the Shell Briefing Service, and used to legitimate investments in alternative energy.[77] At the same time, oil firms also invested in the development of new forecasting methodologies, above all Scenario Planning, which Shell pioneered, but also energy modeling to project future energy supply and consumption.[78] Gulf Oil, for example, put a vast effort into forecasting, which shaped expectations of

future energy constellations and the company's investment decisions. Gulf Oil's decision to go "all-in" with nuclear and coal was in the expectation that those alternatives would become essential energy sources next to and, at some point, instead of oil.[79]

Today we know that the expected oil scarcity never came. On the contrary, much more oil was found inside and outside OPEC, and enhanced oil recovery (EOR) techniques enabled companies to squeeze more oil out of existing reservoirs. Then came the "counter-shock" with the dramatic drop in the price of crude oil in 1986, when OPEC cooperation failed and the market was flooded with oil anew.[80] There was also a drop in demand and changing expectations; while oil planners had anticipated oil demand in industrialized countries to rebound after the price shocks, the reality was that oil demand stabilized after 1973 and only grew again after 1990.[81] The expectations that oil planners and executives throughout the industry had until then—that oil prices would remain at a high level and help commercialize unconventional and alternative energy sources—were shattered, as became evident in the price forecasts of around 1980 that turned out to be fundamentally wrong.[82] The rise of neoliberal ideals and governments, which led to lower alternative energy subsidies and privatization of national oil companies, was certainly part of the counter-shock, although it was not solely responsible for it. In the oil industry, the price shock meant dramatic drops in oil earnings and a prioritization of the core business—petroleum—and the optimization of its profitability. This happened not least to satisfy shareholders and guard industry leaders from activist investors and corporate raiders targeting oil companies with takeover bids.[83]

As oil earnings declined, companies withheld investments into hydrocarbon exploration and synthetic fuels research, and mostly sold off their alternative energy ventures in the late 1980s. Oil companies followed decarbonization strategies from the 1990s on, with some reinvesting in renewables, although not to the extent they did in the 1970s.[84] That way, the oil industry, which in the 1970s had shown tendencies toward an energy transition and a more serious engagement with environmental issues, evolved into an industry that financed climate deniers, became notorious for greenwashing, and worked towards postponing the end of fossil fuels at any cost. In this business climate, oil companies like Exxon or Total deliberately spread doubt about the science of global warming and supported denialist networks, while also coordinating their opposition in international climate diplomacy at a 1987 IPIECA meeting and with the Global Climate Coalition, an international industry lobbying group against greenhouse gas reduction policies, from 1989.[85] Following their efforts in the 1970s, Anderson and Strong left complicated legacies. Anderson retired from ARCO in 1985 and continued as an independent oilman, while ARCO joined other oil companies in the Global Climate Coalition. Following his oil endeavors and work with the Brundtland Commission that defined *sustainable development*, Strong held another post in global environmental governance as the chairman

of the 1992 Rio Earth Summit, where he once more propagated a dialogue with business that ended up giving the corporate world and oil companies a stage for opposition and denial.[86]

Conclusion

Between 1970 and the mid-1980s, the international oil industry faced a myriad of challenges, from the OPEC oil revolution, environmental debates, and regulations, to the uncertain future of oil availability and demand. In dealing with the shock of the 1970s, oil companies and individual oil executives responded not only by pushing back or denying the problems, but also by addressing the challenges and even promoting sustainable development and environmental governance. A highly influential circle around the oil executives Robert O. Anderson and Maurice F. Strong encouraged debates about the environment and resource scarcity—including global warming and *Limits to Growth*—and shaped leading international environmental organizations and institutions. It did this through the Aspen Institute for Humanistic Studies, the IIEA and its successor organization, via the ICC, and at the 1972 Stockholm Conference on the Human Environment and the resulting UNEP. Thereby these oilmen promoted the concept of environmental management, which they said industry needed to embrace, instead of restrictive environmental regulation at the national and international levels.

At the same time, oil companies initiated a shift toward alternative energy by investing in solar, nuclear, geothermal, and other energy technologies in the expectation that oil resources would become scarce. Facing the environmental challenge, oil firms responded both by pushing back against regulation, but in the end also by collaborating in addressing the emission problems of sulfur and lead. As for the carbon problem and the emerging consensus on anthropogenic warming, oil actors were generally aware of it but did not immediately resort to denialism, while Strong and Anderson openly acknowledged the scientific consensus and raise awareness of it. In trying to understand the relationship between oil industry leaders, environmentalism, and climate science before the 1990s, it is essential to recognize the evolution of their positions and the fundamental turning point the counter-shock to oil prices of the mid-1980s represented. When oil prices crashed, companies turned from alternative energy back to oil, started denying the science on global warming, and conspired to obstruct meaningful climate policies. The oil industry's climate denialism and obstruction were not predetermined or inevitable, as in the 1970s, oilmen and oil companies thought of a future beyond oil, promoted environmental debates and governance, and were preparing to eventually transition to alternative energies.

Notes

1 Columbia University. Joseph E. Slater Papers 19-9. Anderson/Slater meetings: Notes from Hermosa, December 10, 1974 (first draft).

2 See correspondences in Nixon Presidential Library. White House Central Files. Alphabetical Name Files. Anderson, Robert O.
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