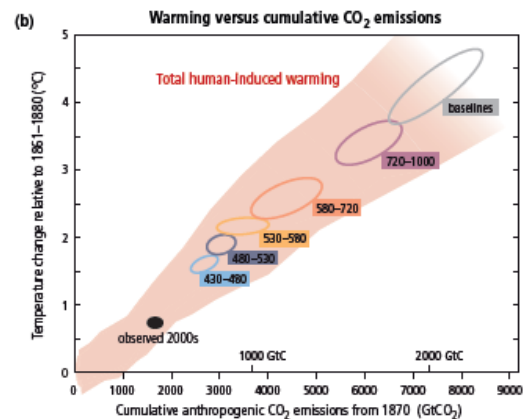
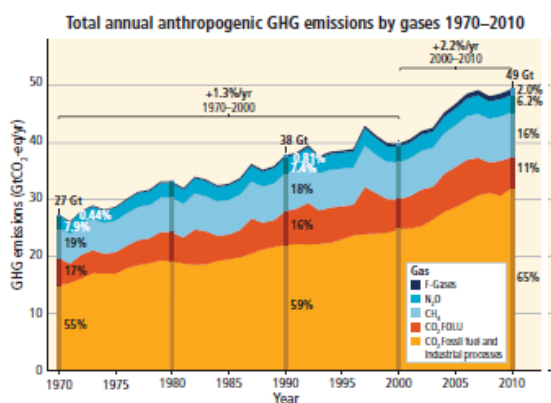


Does the Paris Agreement prevent from financing Oil & Gas projects ?

The Paris Agreement

The first objective of the Paris Agreement is to “keep a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels (1861-1880) and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius”¹. In order to make it happen NGOs, Green parties, some Development Banks, among others, propose to stop financing Oil and Gas.

The main driver of global warming is the emissions of greenhouse gases (GHG). The main GHG are carbon dioxide (CO₂) for 76%, methane (CH₄) for 16%, nitrous oxide (N₂O) for 6% and fluorinated gases (F-gases). In its 2014 report², the IPCC presented the link between global warming and cumulative GHG emissions, which had amounted at 1,900 GT eq CO₂ in 2010. If annual new net emissions were to remain at their level of 2010 (49 GT eq CO₂/year), cumulative emissions would amount at 7,000 GT CO₂ by 2100 and global warming could reach 4° to 5° by 2100. To limit global warming below 2°, cumulative new net emissions should be limited at 480-530 GT CO₂ until 2100. To limit global warming at 1,5°, the limit would be at 430-480 GT CO₂.



Source IPCC Report 2014

Taking into account actual trends, the net emissions of GHG need to be reduced to zero around 2050 (to limit the global warming at 1,5°) and in any case well before 2100 (to limit it well below 2°). Reaching zero net emissions means first the reduction of emissions and second the recourse to some tools, beginning with reforestation, to capture CO₂ and other GHGs.

The Paris Conference decided to share the efforts to reduce emissions of GHG through Nationally Determined Contributions (NDCs). Each country has to update every 5 years its Intended Nationally Determined Contributions (INDCs). The more polluting (and richer) countries were committed to reduce more rapidly their emissions. In 2015 the EU as a whole accepted to reduce its emissions in 2030 by 40% vs 1990 (or 30% vs 2005). Some low-developed countries (LDCs) were “allowed” to increase them but were also requested to present two scenarios, one called “BAU - Business as Usual” and the other one based on measures to reduce emissions GHG. As the second scenario is more costly, its costs are supposed to be mainly supported by richer countries.

¹ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

² https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf

The view of the IPCC on primary energy sources in 2050

In its 2019 report³, the IPCC considers 4 scenarios to limit global warming at 1,5° in 2100. All the scenarios assume zero net emissions by 2050.

1. Scenario 1 is based on dramatic changes with a reduced economic growth, limited recourse to energy and capture of CO₂ limited to reforestation. It raises political and social issues.
2. Scenarios 2 and 3 are based on some changes in growth and utilized energies as well as on the recourse to BECCS (Bioenergy with Carbon Capture and Storage⁴) to capture GHG.
3. Scenario 4 is based on higher levels of emission and a massive recourse to carbon capture instruments (including BECCS). This recourse to reach zero net emission is questionable.

IPCC Scenarios (1,5° global warming)	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	2030	2050	2030	2050	2030	2050	2030	2050
Final energy demand (vs 2010)	-15%	-32%	-5%	2%	17%	21%	39%	44%
GHG Emissions (vs 2010)	-50%	-82%	-49%	-89%	-35%	-78%	-2%	-80%
Cumulative CCS until 2100 (GT CO ₂)		0		348		687		1 218
including BEBCS (GT CO ₂)		0		151		414		1 191

Source IPCC Report 2019

As regards sources of energy, renewables and nuclear will develop. Interestingly, the IPCC also considers that in all these scenarios, the utilization of oil will mainly decrease after 2030 (after coal) but not disappear. Gas will decrease in a lesser proportion than oil (and even increase in scenario 3).

Sources of primary energy (vs 2010)	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	2030	2050	2030	2050	2030	2050	2030	2050
Renewable (but biomass)	430%	833%	470%	1327%	315%	878%	110%	1137%
Biomass	-11%	-16%	0%	49%	36%	121%	-1%	418%
Nuclear	59%	150%	93%	98%	98%	501%	106%	468%
Coal	-78%	-97%	-61%	-77%	-75%	-73%	-59%	-97%
Oil	-37%	-87%	-13%	-50%	-3%	-81%	86%	-32%
Gas	-25%	-74%	-20%	-53%	33%	21%	37%	-48%

Source IPCC Report 2019

The view of the IAE on primary energy sources in 2050

In its 2019 Outlook, the IAE also considers different scenarios for 2040 and 2050 :

- Current Policies, based on trends observed in 2018
- Stated Policies, based on INDCs already made public
- Sustainable Development, compatible with the Paris Agreement assuming a global warming of 1,8°.

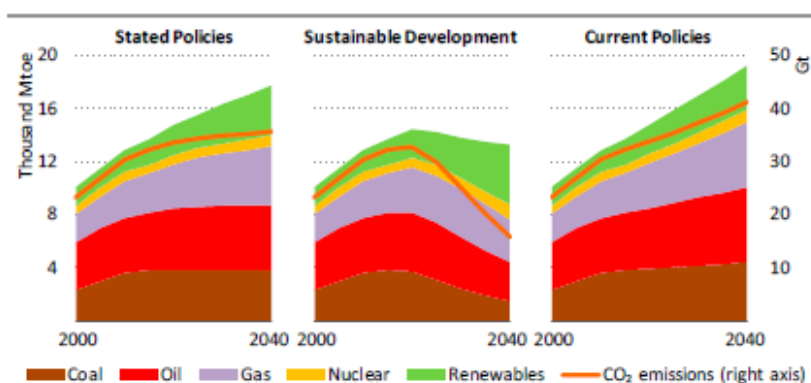
This last scenario would lead to zero net emission around 2070. It means that:

- Economic production should be much more energy-efficient. With a GDP multiplied by 2.6 between 2018 and 2050, demand for energy would slightly reduce (-8,5%)
- Production of energy should be much cleaner. CO₂ intensity (per Toe of energy) would almost be divided by 3. This would be partially achieved through the recourse to CCUS (Carbon Capture, Utilization and Storage) instruments (2,78 GT of CO₂ in 2050 vs 0,03 GT in 2018).

³ https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

⁴ https://www.globalccsinstitute.com/wp-content/uploads/2019/03/BECCS-Perspective_FINAL_18-March.pdf

Figure 1.1 ▶ World primary energy demand by fuel and related CO₂ emissions by scenario



Source IAE – Outlook 2019

Electricity will become increasingly important (and renewable energies would generate 67% of the electricity in 2040 vs 26% in 2018).

Evolution primary demand	2010	2017	2018	2025	2030	2035	2040	2050
Coal	100%	104%	105%	86%	67%	51%	40%	29%
Oil	100%	108%	109%	105%	97%	85%	74%	64%
Natural gas	100%	114%	119%	128%	128%	124%	115%	86%
Nuclear	100%	96%	99%	107%	125%	142%	160%	213%
Hydro	100%	119%	122%	145%	165%	184%	201%	
Bioenergy	100%	110%	113%	113%	110%	123%	135%	345%
Other renewables	100%	233%	266%	612%	1010%	1495%	2031%	
Total	100%	109%	111%	111%	107%	105%	103%	102%

Source IAE – Outlook 2019

The IAE considers that the use of coal and oil will regularly decrease (in different proportions) over the whole period while gas will be more used until mid 30's, to manage the transition, and then decline as it remains a source of GHG. However, they will not disappear for several reasons :

- For non-energy usages, there are sometimes inevitable for the time being in the absence of credible alternatives (anodes, steel or cement for coal; bitumen and lubricants for oil; some chemical products for gas).
- As a source of energy, they cannot be always fully displaced as electricity cannot be used in every situation and renewable energies will not secure supply as long as the storage issue is not solved.
- Natural gas might be blended with biomethane and low-carbon hydrogen, when they will be produced under satisfactory conditions (around 2040 ?).

This scenario includes :

- Universal access to electricity (keeping in mind that 600 m persons had no access to it in 2017, mainly in Africa) with off-grid solar energy, mini-grids and also better distribution networks.
- Access to clean cooking for 2.5 billion people which use today traditional biomass. This could be achieved with more efficient wood cookstoves, LPGs (Liquified Petroleum Gas) or some access to electric cooking. The impact on deforestation and public health (with much lower emissions of particulates) would be very positive. In Sub-Saharan Africa, 2/3 of the energy demand is linked to biomass in 2018 ! For example, Ghana INDCs⁵ indicate that LPGs could serve 55% of cooking needs in peri-urban and rural areas in 2030 instead of 5%.

⁵ https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Ghana%20First/GH_INDC_2392015.pdf

The IAE estimates that a 1.5° scenario with 0 net emissions by 2050 would be difficult to reach as it probably implies :

- More investments than in the Sustainable Scenario, while the financing of this scenario is not yet fully identified in Advanced Economies and more importantly in Developing Economies
- A massive decommissioning of existing infrastructures. Most buildings would have to be retrofitted to become zero energy and heated using zero carbon means. All new cars should be electric by 2030 in advanced economies and a few years later on worldwide, which means much more carbon-free power.
- A large social acceptance of dramatic behavioral changes in all countries
- A massive recourse to instruments to capture carbon, although their possible negative impacts are not yet fully identified.

In this scenario, investments in energy would be multiplied by 2 to reach \$ 3,9 Tn per year in 2035. They will be mostly dedicated to the end-use segment (individual renewable sources of energy - x7 – and energy efficiency – x 4) as well to electricity networks (x 2) and some power plants. The Sustainable Development Scenario is more costly (by 21%) than the prolongation of Current Policies.

World investments	2014-2018	2019-2030	2031-2040	Sustainable Development	Current Policies
(billion dollars, 2018)	Average annual			Cumulative 2019-2040	
Oil and natural gas	827	681	505	13 227	24 337
Coal	98	22	20	461	1 338
Biofuels	5	24	42	700	255
Power plants	483	653	793	15 767	10 336
Electricity networks	291	345	631	10 444	8 488
Fuels and power	1 706	1 741	2 030	41 185	45 097
Energy efficiency	238	625	916	16 654	9 497
Renewables and other	127	332	950	13 490	4 148
End-use	365	957	1 866	30 143	13 645
Total	2 071	2 697	3 896	71 329	58 742

Source IAE – Outlook 2019

In the Sustainable Scenario, the production of oil would be at 57 mbpd – million barrels per day - in 2050 (vs 97,7 mbpd in 2018) in. If investments were limited to existing fields, the production could drop to 22,4 mbpd. It could even decline to 6,8 mbpd without any investments. Similar impacts would appear for gas and it would question the use of gas during a transition period (in the 20' and the 30's). Required investments in oil & gas will be divided by 2 vs Current Policies.

For the IAE, a Sustainable Scenario will also create a pressure to only support low-investment costs oil & gas projects. Prices would decline in this scenario (by 1/3 between 2010 and 2040) while they would increase in the other scenarios, which assume higher levels of production (+52% to 61%).

Oil & Gas prices				Sustainable		Stated		Current	
	2000	2010	2018	2030	2040	2030	2040	2030	2040
IAE Crude oil (\$/barrel)	40	90	68	62	59	96	103	114	154
Gas (\$ / mbbtu) USA	6,1	5	3,2	3,2	3,4	3,3	4,4	3,8	5,1
EU	4	8,8	7,6	7,5	7,5	8,4	8,9	8,9	9,9
China	3,5	7,7	8,2	8,6	8,7	9	9,8	9,8	10,7

The IAE report also provide with interesting data, comparing developed and developing economies.

	Developing economies				Developed economies					
	2010	2018	2030	2040	2010	2018	2030	2040	% 2010	% 2040
Population (million)	5 650	6 269	7 138	7 766	1 277	1 333	1 382	1 407	18%	15%
GDP (\$2018 billion, PPP)	51 494	75 078	131 358	190 968	51 206	60 246	74 483	88 482	50%	32%
Total primary demand	6 996	8 433	8 618	8 732	5 498	5 464	4 707	4 126	44%	32%
Total CO2	16 888	20 304	17 009	11 003	12 403	11 646	6 959	3 774	42%	26%
Coal	2 547	2 957	2 210	1 325	1 106	864	220	146	30%	10%
Oil	1 774	2 136	2 185	1 858	1 991	1 949	1 428	864	53%	32%
Natural gas	1 409	1 749	2 078	2 096	1 340	1 524	1 423	1 054	49%	33%
Bioenergy	926	1 019	757	948	277	337	170	224	23%	19%
Other renewables (inc Hydro)	225	386	1 019	1 904	181	268	528	834	45%	30%
Nuclear	115	187	369	602	603	522	526	547	84%	48%

Source IAE – Outlook 2019

Financing investments in oil & gas

While the IPCC and the IAE diverge on the targeted level of global warming of the Paris Agreement (1,5° or 1,8°) and hence on the date where net emissions of GHG will vanish (2050 or 2070), the IPCC scenarios 2 & 3 converge with the IAE forecasts on several points :

- A need to stabilize energy demand (below its current level for the IAE, above for the IPCC) and for cleaner energy thanks to renewables (and nuclear)
- A sharp reduction of coal (-71% to -77%) which will remain very important for some developing countries
- A reduced role for oil (-50% to -80% in 2050 for the IPCC, -36% for the IAE)
- A need for natural gas during an interim period before its reduction (-53% to +21% for the IPCC, -14% for the IAE). The IPCC even considers a scheme with more gas (combined with much less oil). Investing now in gas might help the introduction of biomethane and low-carbon hydrogen in 15-20 years as existing gas infrastructure might then prove useful.

The absence of investments in oil & gas might question the transition in some developing economies. They would represent 2/3 of their consumption (vs 50% in 2010)! The lack of supply could preserve more polluting sources of energy such as wood or coal, which are the cheapest energies. For the UNCTAD⁶, in order to meet SDGs (Sustainable Development Goals) by 2030, investments in developing countries should range between \$ 3,3 and 4,9 tn / year while available financing in 2014 only amounted at \$ 1,4 tn. As shown by published INDCs, the cleanest solutions are more expensive and their development will not occur in the absence of financing. The consequences of an increased investment gap in developing countries, linked to an exclusion of oil & gas, should be considered.

Many financial actors adopted coal policies, with a ban on investment in coal-related projects. However, most of them limit it to thermal coal, considering that for some industrial usages (steel, cement, anodes,...), there is today no viable alternative. And some actors, including NGOs, recognize that in some remote places, there is no alternative to coal-fired power plants. A nuanced approach would make sense too for oil & gas, considering the need for a transition phase. Europe can probably afford to be more aggressive in 2020 (supporting a reduction of 40% of net emissions of CO2 in 2030 vs 2005 or 55% vs 1990) instead of 30% vs 2005 as approved in 2016. But many developing countries

⁶ <https://www.ifc.org/wps/wcm/connect/842b73cc-12b0-4fe2-b058-d3ee75f74d06/EMCompass-Note-73-Closing-SDGs-Fund-Gap.pdf?MOD=AJPERES&CVID=mSHKI4S>

cannot and, in the absence of reliable sources of energy, a doubt on the achievement of a sustainable growth in line with the SDGs will appear.

In a Sustainable Scenario, requested investments in oil & gas will probably be divided by 2 over the next 40 years. Hence, financing required by these projects will decrease. In order to select projects, a few criteria should be considered, such as :

- The compliance of the project with the INDCs. The lack of consideration by developed countries for the INDCs prepared by developing countries might question their role in the latter.
- The compliance with stringent rules on environmental, human and social impacts such as the Equator Principles (EP), keeping in mind that most large energy projects, including those based on solar or wind energy, are classified as impacting projects (Category A) and then need to be reviewed carefully when they are financed by commercial banks. It would be better to develop projects with sponsors and EP banks committed to respect strict rules rather than with less cautious sponsors, using looser E&S criteria, and financial actors, using weaker financial rules.
- The efficiency of the production process in terms of associated GHG and natural resources
- The capacity to face with the low pricings envisaged by the IAE in its sustainable scenario

Conclusion

The success of the Paris Agreement, with a global warming well below 2° is an obligation. It requests more investment in the end-use segment and in renewables. If it does not prevent to use oil and gas, its successful implementation means a clearly limited use of fossil fuels.

For the IPCC, the de-growth scheme (Scenario 1) is not the only way to meet the objectives of the Paris Agreement. Oil consumption will decline gradually and regularly. Even in Scenario 1, the level of oil production (around 17 mbpd in 2050) will request some investments as its production might establish at only 6 mbpd if no investment is considered. Scenario 2 refers to a 44 mbpd production, which means the development of new fields. Natural gas might be a tool to manage in a first stage the transition towards a cleaner world, using low-carbon hydrogen and bio-methane. The scenario 3 of the IPCC even suggests an increased production of gas (at the expenses of oil).

The development of some new oil & gas projects, based on some clear criteria (strict E&S standards, low costs of production, compliance with INDCs,...), will be required to maintain the levels of production identified by the IPCC or the IAE in their scenarios in line with the Paris Agreement.

NGOs are in their role when they promote a stringent lecture of the Paris Agreement with a 1,5° global warming, but a nuanced approach, referring to the IPCC (and not only its Scenario 1) or IAE data, should prevail. The consequences of a ban on oil & gas on the SDGs should also be considered, keeping in mind the financial cost of such a ban and the already prevailing financing gap of the SDGs.

End-use and renewables will need for much more financing, but some investments in oil & gas projects, including new ones, will be requested. In the absence of the latter, the most affected countries will be the poorest ones. Developing economies are and will remain the larger users of oil & gas. They need for more energy to develop and to reach the SDGs, which is another commitment made by all UN countries. The pressure should rather exert on the selection than the exclusion of projects, including new fields. Projects supported by EP banks and other committed actors might better assessed. Leaving these projects to sponsors and financiers using looser E&S criteria might be counterproductive. And a difference among oil and gas would probably make sense at some stage.