

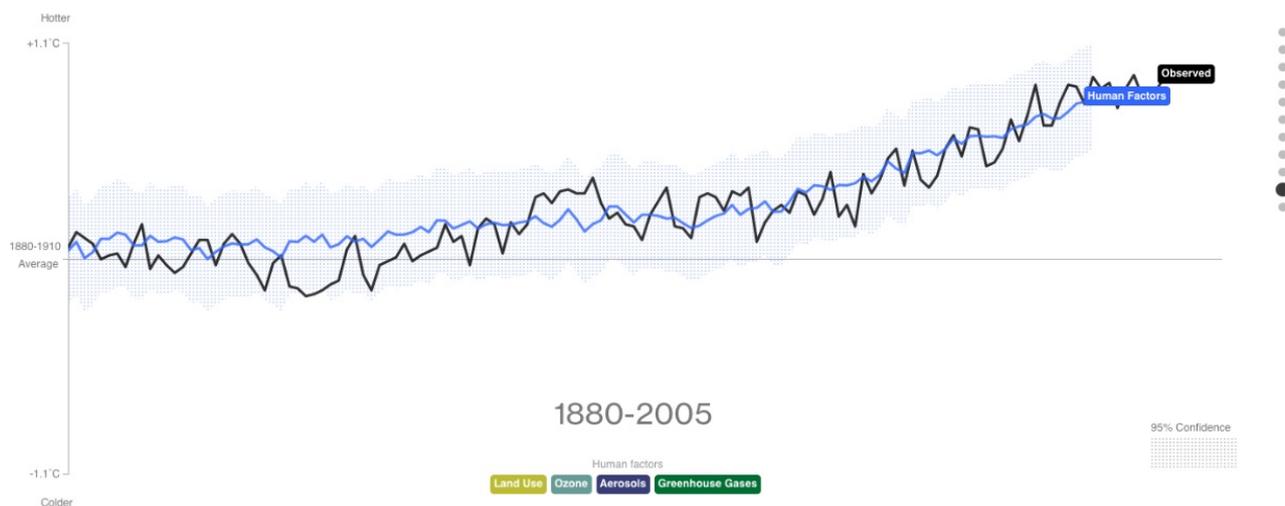


Energy & Climate Change: The Start of Climate Litigation

June 25, 2015. [Climate change is a “medical emergency” according to new global health report](#) by Climate Council. “A major new Commission published in prestigious British medical journal The Lancet has found that climate change is a “medical emergency” with **threats to human health so great that it could reverse the last 50 years of gains in development and global health.** According to the report, the direct health effects of climate change come from the increasing frequency and intensity of extreme weather events such as heat waves, floods, droughts and storms. Indirect health impacts come from changes in the spread of disease, air pollution, food insecurity and malnutrition, involuntary migration, displacement and conflicts. However, the study also found that while the “unacceptably high and potentially catastrophic” human health risks posed by climate change have been underestimated, global efforts to tackle climate change represent one of the greatest opportunities to improve global health this century. The report found that **climate change action can bring immediate health gains** – such as reduced respiratory diseases from burning fewer fossil fuels; reduced pollution, road traffic accidents, obesity, diabetes, coronary heart disease and stroke from increased walking and cycling; as well as an improved diet which could arise from eating less red meat. The Commission concludes that while the **technology and finances required to tackle the health risks posed by climate change are available, global political will to implement them is lacking, and an emergency international response is required.** You can access the full report from The Lancet [here](#).”

See for Yourself

Greenhouse gases warm the atmosphere. Aerosols cool it a little bit. Ozone and land-use changes add and subtract a little. Together they match the observed temperature, particularly since 1950.



June 24, 2015. [What's Really Warming the World](#) by Eric Roston and Blacki Migliozi, Bloomberg Business. “Skeptics of manmade climate change offer various natural causes to explain why the Earth has warmed 1.4 degrees Fahrenheit since 1880. But can these account for the planet’s rising temperature? Scroll down to see how much different factors, both natural and industrial, contribute to global warming, based on findings from NASA’s Goddard Institute for Space Studies.”

June 24, 2015. [A landmark in climate litigation](#) by Frances Lawson, International Climate Change Blog. “As legal precedents go, this could be one of the most significant of our time. A Dutch court has just compelled the country’s government to increase its carbon emissions reductions over the next five years (...) This was a case of “people power”, the litigation having been brought by a class action of 900 Dutch citizens asserting that anything above 2 degrees of warming would constitute a “violation of human rights”. With President Francois Hollande set to launch a “Declaration of Human Rights and Climate Change” as part of the French Presidency of the COP21, **the human rights aspect to climate change is likely to feature with increasing prominence over the coming years ... not least as a vehicle for bringing climate actions before the courts.** The judgment in English can be found [here](#)”

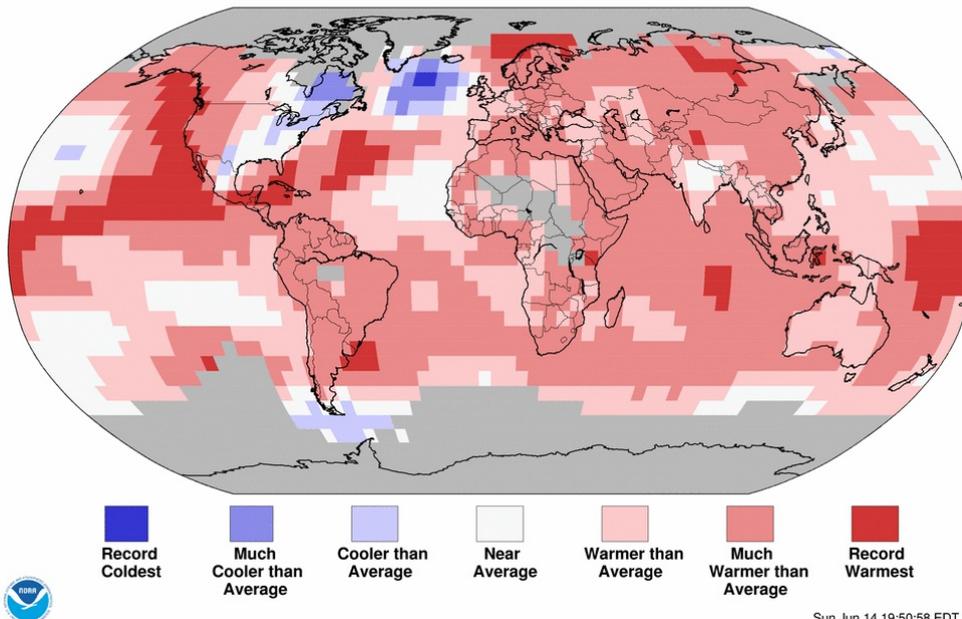
June 24, 2015. [Hague climate change judgement could inspire a global civil movement](#) by Emma Howard, The Guardian. “Dutch ruling could trigger similar cases worldwide with citizens taking their governments to courts to make them act on climate promises”

June 24, 2015. **Dutch Court: Global Warming Of More Than 2 °C Violates Fundamental Human Rights. Netherlands ordered to cut greenhouse gas emissions** by Anna Holligan, BBC News. “A Dutch court has ordered the government to cut greenhouse gas emissions by at least 25% by 2020, in a case environmentalists hope will set a precedent for other countries (...) Jasper Teulings from Greenpeace called it a “**landmark case**”. “**It shifts the whole debate.** Other cases are being brought in Belgium, the Philippines. **This is the start of a wave of climate litigation.**” (...) **The judgment was unprecedented in Europe, and unexpected.** It pushes the Dutch government to honour its commitment to cut emissions. In terms of the practical implementation, the government has already agreed to close coal plants, increase the use of windmills and solar energy and drastically reduce gas extractions in the north of the country. The court case puts pressure on the government to speed up the process in order to meet the targets and become more energy efficient within the next five years. **The judgment is legally binding, and based on "Tort Law" - a general and universal concept which essentially refers to a duty to refrain from causing harm.**

Land & Ocean Temperature Percentiles Jan–May 2015

NOAA's National Centers for Environmental Information

Data Source: GHCN–M version 3.3.0 & ERSST version 4.0.0

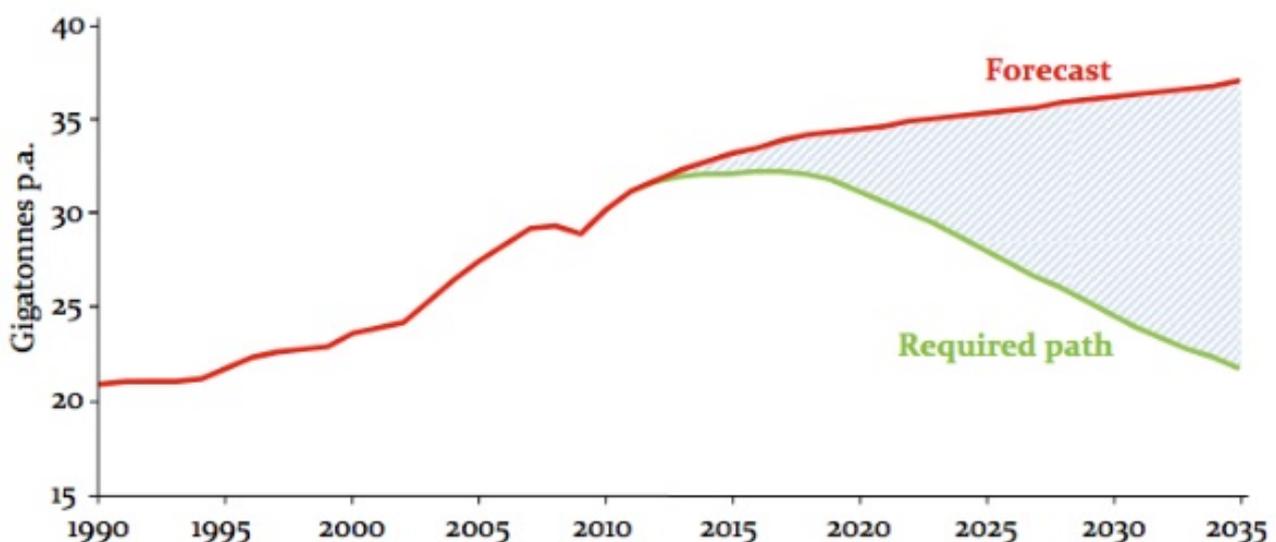


NOAA: “The [first five months of 2015](#) were the warmest such period on record across the world's land and ocean surfaces”

June 24, 2015. [Climate change is killing us. We must use the law to fight it](#) by Richard Wilkinson and Kate Pickett, The Guardian. “**The ‘Claim the Sky’ campaign aims to save lives by protecting the atmosphere as a global asset, with governments taking legal action against those who pollute it.** How many deaths does climate change have to cause before someone takes responsibility? Our current use of fossil fuels has “potentially catastrophic effects for human health and human survival”, according to a major new report released on Tuesday by medical journal the Lancet and University College London. And it’s not as if we still have time before climate change starts to bite.”

June 8, 2015. [People’s Declaration for Climate Justice](#). “We, the people of Vanuatu, Kiribati, Tuvalu, Fiji, Solomon Islands and the Philippines continue to experience the impacts of **climate change – the single biggest human rights, environmental and humanitarian crisis of our time.** It has claimed thousands of lives, displaced millions of people, damaged livelihoods, and caused a severe economic toll in relief, rehabilitation and reconstruction efforts. The burning of fossil fuels by big polluters has been found to be primarily responsible for emitting large amounts of greenhouse gases. The concentration of said gases, especially carbon dioxide in the atmosphere causes climate change. An estimated 25-30% of the carbon dioxide emitted by these activities was absorbed by the oceans, causing ocean acidification. As the people most acutely vulnerable to the impacts of climate change, we will not let the big polluters decide and assign our fate. Our rights and ability to survive must not be dictated by the continued addiction to the burning of fossil fuels. **We refuse to accept the “new normal” and demand for climate justice by holding the big polluters and their respective governments to account for their contribution to the climate crisis.** Our people and our environment must be preserved for the generations to come. We are from island states in shared oceans. We stand in solidarity. We commit to holding those most responsible for climate change accountable. By doing so, we send a message of hope that the people and not the polluters are in charge of humanity’s destiny. We commit to bring a case that would investigate the human rights implications of climate change and hold the big carbon polluters accountable to appropriate international bodies or processes.”

Energy-related CO₂ emissions



Tipping Point for Renewables

June 26, 2015. [Bill Gates calls for Manhattan Project-style renewable energy drive](#) by Ian Johnston, The Independent. **“Governments should invest in research into renewable energy on the same scale as the Manhattan Project and the Apollo moon missions, Bill Gates has said as he revealed he planned to double his own investment in green technologies to nearly £1.3bn (...) Mr Gates, the founder of Microsoft, said “great innovation” was still needed to make energy in a way that would reduce carbon dioxide emissions significantly. And this would only be achieved if governments spent tens of billions of dollars on research and development into new renewables, he said. “Because there’s so much uncertainty and there are so many different paths, it should be like the Manhattan Project and the Apollo Project in the sense that the government should put in a serious amount of R&D,” he told the Financial Times (...) But Mr Gates also suggested savvy private investors stood to make a fortune in the renewable industry in much the same way as those who picked the right firms at the dawn of the computer age.”**

June 25, 2015. [Wall Street Pumps Billions Into Renewable Energy](#) by Tim Puko, Wall Street Journal. **“After years of lofty promises, Wall Street believes the renewable energy industry can produce a payoff. In just a few years, investors have gone from zero to billions in the amount of money they’re pumping into renewable-energy companies and environmentally friendly projects (...) Analysts, bankers and investors at the Renewable Energy Finance Forum in New York this week were ebullient. Many see the sector as past a tipping point: Skepticism has melted among the financial brokers of the energy world, and they have started to fund the renewable-power sector as a legitimate upcoming rival to fossil fuels (...) The investments are paying off, too. From the start of 2013 through April, the WilderHill New Energy Global Innovation Index — which tracks companies that focus on cleaner energy, conservation and efficiency – has returned about 50%, while the S&P 500 Oil & Gas index has been virtually unchanged. The Stowe Global Coal index has lost more than 50%”**

June 18, 2015. [Day Of Reckoning For Fossil Fuel Industry](#) by Mindy Lubber, Forbes. **“The fossil fuel industry is facing its day of reckoning – and not just because one of the world’s most prominent religious leaders, Pope Francis, is calling for action. In fact, the industry’s moment of crisis has been in the making for years, as a variety of trends – from rising production costs to cheaper renewable energy and expanding carbon-reducing rules – have taken stronger hold. Today, the fossil fuel monolith is under attack from some of the same people it used to count as its closest friends – Wall Street analysts, investors and governments – because fossil fuels are no longer a safe bet. It has become impossible to ignore the systemic financial risks inherent in the production of coal, oil and other fossil fuels.”**

June 18, 2015. [REN21's Renewables 2015 Global Status Report](#). **“Renewable Energy’s Record Year Helps Uncouple Growth of Global Economy and CO2 Emissions (...) Despite the world’s average annual 1.5% increase in energy consumption in recent years and average 3% growth in Gross Domestic Product, carbon dioxide (CO2) emissions in 2014 were unchanged from 2013 levels. For the first time in four decades, the world economy grew without a parallel rise in CO2 emissions. The landmark “decoupling” of economic and CO2 growth is due in large measure to China’s increased use of renewable resources, and efforts by countries in the OECD to promote more sustainable growth—including increased use of energy efficiency and renewable energy. “Renewable energy and improved energy efficiency are key to limiting global warming to two degrees Celsius and avoiding dangerous climate change,” says REN21 Chair Arthouros Zervos, who released the new report at the Vienna Energy Forum (...) The sector’s growth could be even greater if the more than USD 550 billion in annual subsidies for fossil fuel and nuclear energy were removed. Subsidies perpetuate artificially low energy prices from**

those sources, encouraging waste and impeding competition from renewables (...) **Employment in the renewable energy sector is growing rapidly as well.** In 2014, an estimated 7.7 million people worldwide worked directly or indirectly in the sector.”

TABLE 1. ESTIMATED DIRECT AND INDIRECT JOBS IN RENEWABLE ENERGY WORLDWIDE, BY INDUSTRY

| | World | China | Brazil | United States | India | Japan | Bang-ladesh | European Union ¹ | | |
|---|--------------------------|--------------|------------------|------------------|------------|------------|-------------|-----------------------------|------------|------------|
| | | | | | | | | Germany | France | Rest of EU |
| THOUSAND JOBS | | | | | | | | | | |
|  Biomass ^{a,b} | 822 | 241 | | 152 ^f | 58 | | | 52 | 53 | 238 |
|  Biofuels | 1,788 | 71 | 845 ^d | 282 [*] | 35 | 3 | | 26 | 30 | 42 |
|  Biogas | 381 | 209 | | | 85 | | 9 | 49 | 3 | 14 |
|  Geothermal ^a | 154 | | | 35 | | 2 | | 17 | 33 | 54 |
|  Hydropower (Small) ^c | 209 | 126 | 12 | 8 | 12 | | 5 | 13 | 4 | 24 |
|  Solar PV | 2,495 | 1,641 | | | 125 | 210 | 115 | 56 | 26 | 82 |
|  CSP | 22 | | | 174 [*] | | | | 1 | | 14 |
|  Solar heating / cooling | 764 | 600 | 41 [*] | | 75 | | | 11 | 7 | 19 |
|  Wind power | 1,027 | 502 | 36 | 73 | 48 | 3 | 0.1 | 138 | 20 | 162 |
| Total | 7,674ⁱ | 3,390 | 934 | 724 | 437 | 218 | 129 | 371[*] | 176 | 653 |

June 16, 2015. [Pope Francis warns of destruction of Earth's ecosystem in leaked encyclical](#) by Stephanie Kirchgaessner and John Hooper, The Guardian. “Argentinean pope will **align himself with the environmental movement and its objectives.** While accepting that there may be some natural causes of global warming, the pope will also state that climate change is mostly a man-made problem (...) In a surprisingly specific and unambiguous passage, the draft **rejects outright “carbon credits” as a solution to the problem.** It says they “could give rise to a new form of speculation and would not help to reduce the overall emission of polluting gases”. On the contrary, the pope wrote, it could help “support the super-consumption of certain countries and sectors”.

June 8, 2015. [G7 leaders agree on carbon goal — but offer no plan on how they'll do it](#) by Andrew Freedman, Mashable.

June 7-8, 2015. [Declaration G7 Summit: Think Ahead. Act Together.](#) “**Urgent and concrete action is needed to address climate change,** as set out in the IPCC’s Fifth Assessment Report. We affirm our strong determination to adopt at the Climate Change Conference in December in Paris this year (COP21) a protocol, another legal instrument or an agreed outcome with legal force under the United Nations Framework Convention on Climate Change (UNFCCC) applicable to all parties that is ambitious, robust, inclusive and reflects evolving national circumstances. The agreement should enhance transparency and accountability including through binding rules at its core to track progress towards achieving targets, which should promote increased ambition over time. This should enable all countries to follow a low-carbon and resilient development pathway **in line with the global goal to hold the increase in global average temperature below 2 °C.** Mindful of this goal and considering the latest IPCC results, we emphasize that deep cuts in global greenhouse gas emissions are required with a **decarbonisation of the global economy over the course of this century.**”

June 3, 2015. [Global Apollo Programme Aims To Tackle Climate Change](#) by Joshua S Hill,

Clean Technica. “In the deepest chill of the Cold War, then-president of the United States John F. Kennedy announced to the country, and the world, that “we choose to go to the moon.” The Apollo Programme placed a man on the moon within the decade, and now, a new Apollo Programme has been launched, but this time it’s aims are to tackle climate change (...) British energy luminaries are calling for “**a new priority for the discovery of new, cheaper ways to produce, store, and distribute clean energy.**” The current research and development for renewable energy “is under 2% of the total of publicly funded research and development” worldwide — “only around \$6 billion in total. This is hardly commensurate with the gravity of the threat we face,” the authors write. The Global Apollo Programme therefore sees \$15 billion as a “minimum acceptable scale for the Programme in its early years, rising thereafter in line with GDP growth (...) The full report is available to read [here](#) (PDF)”

Gas Role in the Global Energy Transition

June 24, 2015. [New report estimates enough natural gas is leaking to negate climate benefits](#) by Peter Moskowitz, The Guardian. “Natural gas drilling only has environmental benefits over other processes like coal and oil production if producers can keep a tight lid on leaks. Natural gas has been touted as an environmentally friendly substitute to coal and oil production, but a new report estimates enough gas is leaking to negate most of the climate benefits of process.”

June 12, 2015. Open Letter: [Gas will not save the climate, decentralised energy will.](#) “In a letter dated May 29th [see below], **six energy multinationals called for an efficient carbon market to enable the scaling up of gas as a solution to the climate problem.** We, European networks representing local and regional governments across the world, would like to present another vision to UN negotiators and world decision makers alike. Although we support the idea of a well-functioning carbon market, **we believe the world’s energy would be best used if we stopped focusing on one supposedly salutary source of power, technology or market enabler.** Instead, we must devote some attention to the kind of society and governance model that is needed to address the climate challenge. **We would like to stress that the energy transition is already happening. It is being led in and by local authorities.** As motivators, planners, consumers and sometimes energy providers, local and regional governments can act as multipliers in addressing the climate challenge. All across the world, **they are creating new production and consumption systems that are not dependent on one source of fossil energy, but a large mix of distributed, sustainable and decentralised ones.** A decentralisation agenda that can benefit everyone, creating local jobs, business opportunities and regional added value. Through direct cooperation with citizens, civil society, academics and businesses, cities and regions are encouraging all their territory’s actors to take a stake in the energy transition. In a resource-constrained world, they are spearheading new systems of governance where **energy is seen as a common good, not a mere commodity.** They view energy as a resource we ought to save, beyond one that we can sell. While the UN climate negotiations have struggled to make progress for years, cities have taken action. Some are even committing to five to ten years carbon neutral scenarios, becoming net exporters of sustainable energy, divesting their funds from fossil fuel holdings, constructing passive neighbourhoods and investing massively in renewable energy and soft mobility solutions. As they can take decisions at the right scale and speed, **cities are living laboratories of the energy transition.** In Europe, over 6,000 cities have voluntarily committed to implementing sustainable energy action plans through the Covenant of Mayors movement. On average, they plan to reduce emissions by 28% until 2020, well beyond the EU target of 20%, and they are ready to go further. These cities are joining forces across borders, demonstrating the true sense of solidarity and cooperation that should be at the heart of climate negotiations.” Signatories: Thomas Brose, Executive Director of Climate Alliance, Frédéric Vallier, Secretary General of the Council of

European Municipalities and Regions, Claire Roumet, Executive Director of Energy Cities Julije Domac, President of FEDARENE, Wolfgang Teubner, ICLEI Regional Director for Europe

June 2, 2015. [European network for gas and energy innovation founded in Paris](#). “On the occasion of the World Gas Conference in Paris seven leading European research and development organizations have today established an innovative network **to guide gas into the transition process towards a future renewable based energy system**. With the signing of a cooperation agreement the **new R&D network named European Research Institute for Gas and Energy Innovation (ERIG)** will be promoting joint innovation and development work with the participation of research institutes and universities directly affiliated with ERIG members and other cooperation partners. The cooperation agreement aims to develop the role of gas by improving the efficiency of gas related energy conversion processes in the domestic, commercial and industrial area, in particular in the field of gas appliances and other utilization technologies. Furthermore it wants to enhance safety, reliability and economic sustainability of the European gas infrastructure system and gas storages, including LNG as a transport fuel for long distance transport, on land and on sea. Besides **enhancing the share of renewable and synthetic gases, such as biogas, bioSNG, hydrogen or methane**, in the gas system it is one major goal to support the integration of volatile renewable power in the energy system by flexible gas options (Power-to -Gas) to balance the power grid through the combination of demand and supply flexibility and storage. **ERIG will be supporting a strategic research agenda of the European Union concerning energy and gas**. This covers the joint promotion of calls within the framework of Horizon 2020 as well as the development of positions and suggestions to the political sphere. The cooperation agreement has been signed by the French Gas Association (AFG), Danish Gas Technology Centre, German Technical and Scientific Association for Gas and Water (DVGW), Energy Delta Gas Research (EDGaR, Netherlands), Energiforsk – Swedish Energy Research Centre, Swiss Gas and Water Industry Association (SVGW) and the Swiss Association of Gas Industry (VSG). Please **check <http://www.erig.eu> for further information.**”

June 2, 2015. [Opening Ceremony of the 26th World Gas Conference](#). GU President Jérôme Ferrier “hailed the event as a unique opportunity for the industry to unite behind the conference theme: Growing Together Towards a Friendly Planet. **“Over the triennium, I have tried to place natural gas at the heart of the energy debate and the future of our planet,”** he said. Addressing the need to increase the pace at which natural gas should replace coal in order to reduce CO2 emissions, he continued: “The optimal energy mix for power generation rests on a mix of natural gas and renewables.” (...) Patrick Pouyanné, Chief Executive Officer of Total told delegates: “Total has opted for gas. We're convinced that gas has to play a major role in the global energy mix. **The share of Gas should increase to become the 2nd maybe even the 1st energy source in the world.**” Mr. Mestrallett echoed the same sentiment, saying that **gas has a major role to play in leading the transition to the de-centralisation, de-carbonisation and digitalisation of the global energy mix.**”

June 1, 2015. [Quand le patron de Total voit la vie en gaz](#) par Nicolas Stiel, Challenges. “A l'heure du Congrès mondial qui s'ouvre à Paris, les majors lancent une **offensive en faveur du gaz, seul moyen de réduire vite notre bilan carbone. Pour Patrick Pouyanné, c'est l'avenir... si les prix montent** (...) Les renouvelables ont beau connaître une croissance exponentielle, **les hydrocarbures (pétrole, gaz, charbon) représenteront encore 74% du mix énergétique mondial en 2040**, selon l'Agence internationale de l'énergie, contre 81% aujourd'hui. Dans ce cadre, note le pragmatique Pouyanné, autant développer l'énergie la moins polluante.”

June 1, 2015. [Le gaz, une énergie d'avenir en pleine transition](#) par Nathalie Croisé, BFM Business. “Le Congrès Mondial du Gaz ouvre ses portes ce lundi 1er juin à Paris. 5 journées de débats, près de 3.000 délégués internationaux, 500 speakers et 80 pays représentés. **La transition**

énergétique s'organise. L'Union Internationale du Gaz compte bien mettre en avant les atouts de sa filière (...) Pour Jérôme Ferrier, président de l'[Union Internationale du Gaz](#), **“le gaz n’est certainement pas une énergie du passé. Le biogaz, le «power to gaz», le GNV ou le GNL maritime sont quelques-uns des exemples qui démontrent que le gaz est définitivement une énergie d’avenir.”**

June 1, 2015. [Climat: l’industrie du gaz s’invite dans le débat](#) par Jean-Michel Bezat, Le Monde. “Pour de nombreux patrons de l’industrie, la prise de conscience des entreprises a beaucoup progressé depuis l’échec du sommet de Copenhague sur le climat, fin 2009. « Il y a cinq ans, certaines traînaient les pieds et n’ont pas été mécontentes de cet échec, reconnaît Gérard Mestrallet, PDG d’Engie (ex-GDF Suez). Aujourd’hui, **elles avancent plus vite que les gouvernements, car elles savent qu’une catastrophe climatique serait aussi une catastrophe économique.** » (...) Dans son scénario 2050, GrDF prévoit que **73 % du gaz consommé sera d’origine renouvelable (biométhane et gaz produit à partir des excédents d’électricité)**, tandis que l’Agence de l’environnement et de la maîtrise de l’énergie (Ademe) estime cette part à 56 %”

May 29, 2015. [Six Oil Majors Say: We Will Act Faster with Stronger Carbon Pricing. Open Letter to UN and Governments.](#) “Climate change is a critical challenge for our world. As major companies from the oil & gas sector, we recognize both the importance of the climate challenge and the importance of energy to human life and well-being. We acknowledge that the current trend of greenhouse gas emissions is in excess of what the Intergovernmental Panel on Climate Change (IPCC) says is needed to limit the temperature rise to no more than 2 degrees above pre-industrial levels. The challenge is how to meet greater energy demand with less CO2. **We stand ready to play our part** (...) For us to do more, **we need governments across the world to provide us with clear, stable, long-term, ambitious policy frameworks.** This would reduce uncertainty and help stimulate investments in the right low carbon technologies and the right resources at the right pace. **We believe that a price on carbon should be a key element of these frameworks.** If governments act to price carbon, this discourages high carbon options and encourages the most efficient ways of reducing emissions widely, including reduced demand for the most carbon intensive fossil fuels, greater energy efficiency, the use of natural gas in place of coal, increased investment in carbon capture and storage, renewable energy, smart buildings and grids, off-grid access to energy, cleaner cars and new mobility business models and behaviors (...) Signatories: BG Group plc - Mr. Helge Lund, BP plc - Mr. Bob Dudley, Eni S.p.A. - Mr. Claudio Descalzi, Royal Dutch Shell plc - Mr. Ben van Beurden, Statoil ASA - Mr. Eldar Saetre, Total S.A. - Mr. Patrick Pouyanné”

Biomethane Fuels All Type of Vehicles!

June 25, 2015. [First near-zero emission armored security vehicle.](#) “Two global leaders in developing and manufacturing advanced transportation vehicles have teamed up to manufacture a first-of-its-kind fleet of Class-5 armored vehicles that **combine the benefits of Renewable Natural Gas (RNG) and zero emission Plug-In Hybrid Electric Vehicle (PHEV) technology** (...) Today, the Sectran Security trucks make frequent stops as part of their highly congested urban routes. At each stop, the engines are kept idling for security purposes, but now risk violating California’s strict diesel idling regulations, which prohibit idling the engine for more than five minutes. With the modernized trucks, Sectran can completely eliminate engine idling by operating in all-electric mode during stop-and-go operations on urban routes and in hybrid-mode during highway operations. When complete, the vehicles possess impressive performance statistics”

June 24, 2015. Divergent Microfactories Drives the Future of Car Manufacturing with Blade.

World's first 3D-Printed Supercar Built Using Company's 'Node' Technology Platform.

“Divergent Microfactories today unveiled a **disruptive new approach to auto manufacturing** that incorporates 3D printing to dramatically reduce the pollution, materials and capital costs associated with building automobiles and other large complex structures. Highlighted by Blade, the first prototype supercar based on this new technology, Divergent Microfactories CEO Kevin Czinger introduced the company's plan to dematerialize and democratize car manufacturing (...) **The prototype is one of the greenest and most powerful cars in the world.** Equipped with a 700-horsepower **bi-fuel engine that can use either compressed natural gas (CNG) or gasoline**”

June 24, 2015. **WR biomethane project set for Garage 56 in 2017** by Cécile Bonardel/David Goward, 24h Le Mans. “At its traditional pre-race press conference, the Automobile Club de l'Ouest announced that, in 2017, Garage 56 at the 24 Hours of Le Mans would be occupied by the innovative WR biomethane programme (...) The closed-cockpit prototype will however feature a “large” tank to carry the quantity of liquid biomethane required to complete a stint. Obviously liquid gas means extreme cold. The natural gas, containing 90% methane, is transported in liquid form at -162°C in methane tankers. WR will therefore be integrating a cryogenic tank capable of withstanding such low temperatures. **As this liquid biomethane will be produced from household waste reprocessed in methanisation plants, the term “green fuel” is no misnomer.** WR is aiming to reduce CO2 emissions to zero-impact level. As the technology is still in its infancy, plenty of work lies ahead for the team led by Welter and engine designer Jean-Pierre Boudy before WR takes possession of Garage 56 at the 24 Hours of Le Mans in 2017!”

June 24, 2015. **Biogas first boat in the world will be located in Amsterdam-Noord** by luc, Noord (in dutch). “Café de Ceuvel going to build the first biogas boat in the world. This boat can convert organic waste into methane that will be cooked at the restaurant. This is the next step in the mission



of factory De Ceuvel to exclude as much as possible cycles. To get around the funding is there launched a crowdfunding on her first birthday (...) As its name suggests, the **biogas can also sail boat. They will in the future go to festivals to collect the organic waste and convert it to gas in order to allow a wide audience to see what is possible with our waste (...)** To see how you can help you go to <http://www.biogasboot.nl>”

June 24, 2015. **Una moto a biogás en la Feria de los Inventos 2015** por Javier Rico, Energías Renovables. “La VI edición de la Feria de los Inventos de la Universitat Politècnica de València (UPV) expone entre sus creaciones lo que presentan como “el primer prototipo de motocicleta con uso de biogás vehicular como biocombustible”. Aunque no es la primera vez que la UPV investiga

en el desarrollo del biogás como combustible, su uso para llenar el depósito de motocicletas se ha llevado a cabo ya dentro de iniciativas de demostración en Japón y a escala más artesanal en Pakistán (...) Para los miembros del equipo Proyecto Vera, integrado por estudiantes de la Escuela Técnica Superior de Ingenieros Industriales, "el uso de este tipo de biocombustible mejorará la relación prestación/emisiones, mejorando la sostenibilidad del transporte"

June 22, 2015. [La voiture au gaz, solution d'avenir?](#) par Vincent Rousseau, La Tribune. "5cl de carburant pour cent kilomètres: la voiture de demain sera-t-elle à gaz? (...) Avec une distance de 2 551,8 km pour l'équivalent d'un litre d'essence (soit 5 cl de carburant, ou l'équivalent d'un dé à coudre, aux cent kilomètres), Microjoule a réalisé un record historique pour un véhicule roulant au gaz. Parmi les 200 compétiteurs, Microjoule se distingue également comme le vainqueur de cette 30ème édition du Shell Eco-marathon toutes catégories confondues, devant l'essence, le diesel et les autres carburants alternatifs (...) Et avec du gaz issu de la méthanisation des déchets (le biométhane), une filière en plein développement en France et en Europe, les émissions de CO2 peuvent être quasi nulles (...) **L'introduction du gaz dans la compétition du Shell Eco Marathon relève d'une tendance de fond dans le secteur des transports.** Depuis quelques années, on observe un intérêt croissant des constructeurs de véhicules pour les motorisations gaz (...) Avec à peine 40 stations publiques, et une offre de véhicules très réduite, la mobilité gaz peine à se développer en France. Or on estime qu'il serait possible de convertir au gaz environ 10% du parc des véhicules en France d'ici à 2030, ce qui nécessiterait un réseau de 1 500 stations publiques. **Le salut viendra peut-être de l'Europe: une directive demande en effet à chaque Etat membre de fournir d'ici fin 2016 leur plan d'action national en matière de réseau d'avitaillement pour les carburants alternatifs aux carburants pétroliers**, parmi lesquels figurent le gaz, l'électricité et l'hydrogène."

June 18, 2015. [German Ministry of Economic Affairs' study predicts CNG key role.](#) "According to the study, natural gas has great future potential: **NGVs will constitute 9% of all vehicles by 2030**, depending on vehicle class and the development of oil prices. **Besides, experts see NGVs gaining a consistently higher market share than electric automobiles.** The study on "CO2 emissions reduction in passenger automobiles and light commercial vehicles after 2020" examine which CO2 limits are realistic in the future. The result: hybrids allow for great gains in CO2 reductions, but entail high manufacturing costs that are not offset by fuel savings and are thus less economical in the long term. In this regard, the media sees a future in the combination of natural gas and hybrid vehicles (...) **We must not forget the political and strategic dimension of natural gas. It can be mined in the North Sea as well as produced in biomethane or power-to-gas plants"**

June 17, 2015. [Methane powered tractors; fashion or future?](#) by James Rickard, FG Insight.

Tying in with the theme of **a future based on sustainability**, New Holland took the opportunity to update the world on its methane-powered tractor at the Milan Expo. Driven on by its vision of **an energy independent farm concept** which is being piloted at the La Bellotta farm just outside of Turin, New Holland continues to develop and refine its methane powered tractor idea (...) The aim of the second prototype methane-powered tractor was to make it much more akin to a regular tractor in terms of performance and build (...) Commercial availability is a while off yet with New Holland required to undergo five years of



validation testing. **The plan is to get the tractor looking as close as possible to a standard tractor**, says the manufacturer. In theory, the manufacturer says, the price of a methane-powered tractor will be the same as an equivalent diesel-powered model and with lower running costs.”

June 16, 2015. [Salon du Bourget : des avions moins gourmands en carburant](#). Pour les avions de ligne, l'argument premier exposé par les constructeurs au 51^e salon du Bourget est celui de la consommation de carburant. Moteurs plus efficaces, aérodynamique améliorée et poids réduit continuent de rendre plus sobres ces gros porteurs. L'optimisation du contrôle, les biocarburants et le roulage électrique sont aussi à l'ordre du jour, avec le même objectif (...) **Pour tenir ses engagements, l'aviation devra en outre se convertir massivement aux biocarburants**. En quelques années, constructeurs et compagnies aériennes ont réussi à faire voler des avions avec des huiles de friture, de caméline ou de moutarde. Fin 2014, Boeing annonçait son premier vol avec 15 % de « diesel vert », produit à partir d'huiles végétales, d'huiles de cuisson usagées et de déchets de graisses animales. Air France exploite même depuis octobre un vol Toulouse-Orly par semaine avec 10 % de farnesane, un dérivé de la canne à sucre développé par Total et Amyris. **Ces carburants alternatifs destinés à faire voler les avions du futur sont cependant relégués à un usage marginal, les matières premières étant destinées en priorité à l'agroalimentaire**. «Dès lors qu'on trouvera des filières qui ne sont pas en concurrence et qui deviennent compétitives, je pense qu'on y parviendra», prédit Fabrice Brégier, directeur exécutif d'Airbus. Sans se risquer toutefois à avancer une date.”

Mars 21, 2015. [SpaceX Methane-fueled Rocket for manned Mars missions](#). “In the meantime, SpaceX is working on a **new LOX/methane engine** that will power the company's Mars rocket (also known as the “BFR”) at NASA's Stennis Space Center in Hancock Country, Mississippi. **“We call it Raptor**, it will be the engine that should take folks to Mars, that's the plan. The vehicle architecture to do that is a little bit in flux. So the engine performance is in flux. But it'll be a big engine. I don't have the final specs on that engine, we're in development, we're testing injectors right now at Stennis and working on a capability to test in Texas as well. **It'll be a very different rocket**, the densities are different and the diameters are going to change.”

context=

December 18, 2013. [Why is SpaceX considering Methane as fuel for their next engine, the Raptor?](#) “Methane has the benefit of being easier to store than hydrogen. Mostly **passive cooling can suffice to keep it cryogenic**, whereas hydrogen needs active cooling, and will still vent over time. Which makes **Methane much closer to 'storable' than hydrogen can be**. This would make it useful for deep space missions, with long mission durations. **Methane is less bulky than hydrogen**. Which means tankage is smaller for the same mission. **Methane should be simpler to use in an engine due to its higher density than hydrogen, less needs to be pumped by volume**. Methane is potentially manufacturable on Mars. With imported Hydrogen (or native water), CO₂ (Carbon dioxide) can be converted to CH₄ reasonably straight forwardly.

“RRI is an unknown term among scientists & the general public”

June 23, 2015. [Le biogaz et la méthanisation vont-ils encourager la spéculation et la multiplication des fermes-usines?](#) par Bénédicte Weiss and Hélène Février, Basta! “Produire du gaz à partir des déchets devient la nouvelle énergie renouvelable à la mode. Et constitue une manière de « valoriser » les dizaines de millions de tonnes de détritiques organiques générées par l'activité économique comme par les ménages. Cette « méthanisation » des déchets est une piste intéressante pour les collectivités locales, à condition que les techniques de tri et de recyclage suivent le mouvement. Ce qui n'est pas encore le cas. **Cet engouement pour le biogaz risque aussi de provoquer des dégâts collatéraux: multiplication de fermes usines, frénésie concurrentielle entre pays européens, instabilité des prix...**”

June 17, 2015. [Roger Strand: "RRI is a window of criticism, it is a dissident discourse"](#) by Núria Saladié, RRI Tools. “Roger Strand gave a talk on the origin, definition and application of Responsible Research and Innovation (RRI). Strand is a professor at the University of Bergen (Norway), and Chairman in 2014 of the European Commission Expert Group on Indicators for RRI.”

RRI Opportunities

Cross stakeholder

