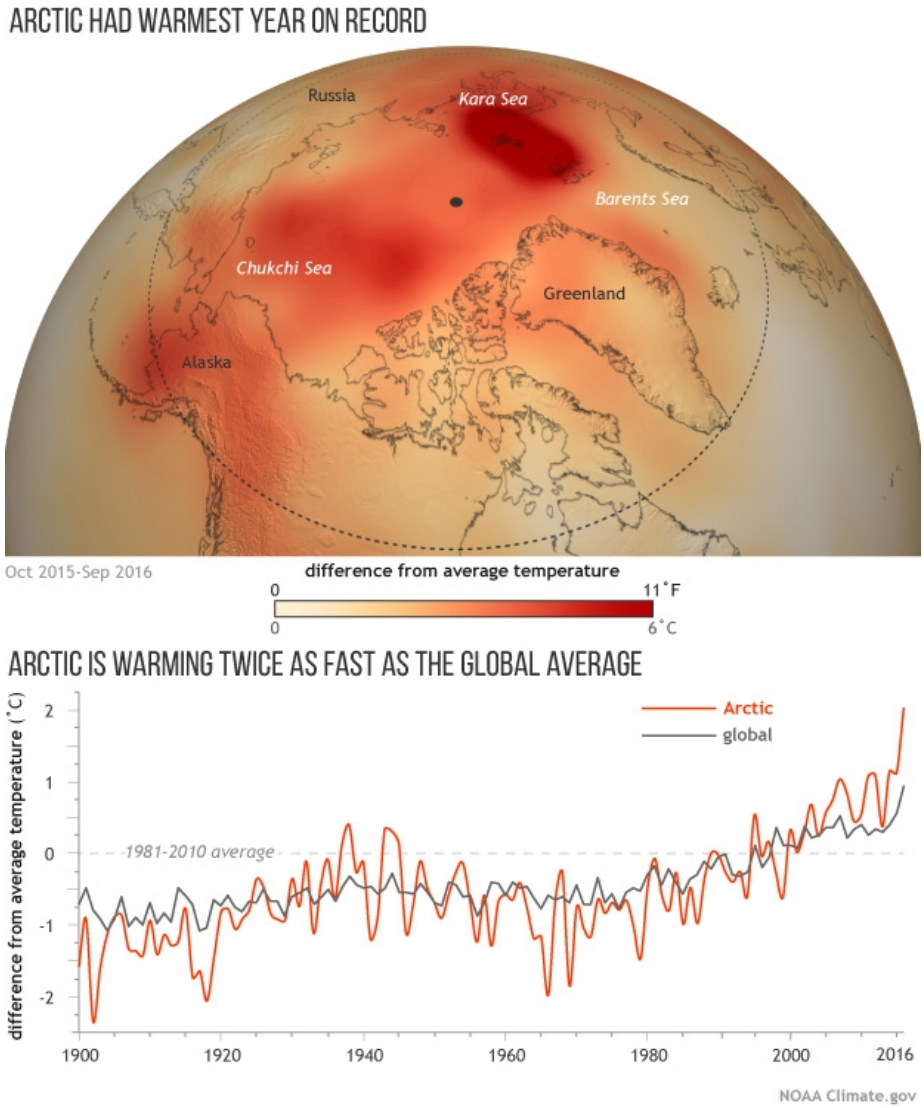
APPLIED NANOPARTICLES

Monthly Anaerobic Digestion Newsletter

December 2016 compilation and overview of cutting-edge biogas industry news

"The next 20 years will be critical for the planet"

December 29, 2016. **Energy-related CO2 emissions for first six months of 2016 are lowest since 1991** by Allen McFarland, U.S. Energy Information Administration (EIA). "U.S. energy-related carbon dioxide (CO2) emissions totaled 2,530 million metric tons in the first six months of 2016. This was the lowest emissions level for the first six months of the year since 1991, as **mild weather and changes in the fuels used to generate electricity contributed to the decline in energy-related emissions**."



December 21, 2016. **2016 remains on track to be hottest year on record** by World Meteorological Organization. "The year 2016 remains on track to be the hottest year on record, with average global temperatures set to break even the records of 2015, according to data covering the first eleven months of the year (...) Long-term indicators of human-caused climate change, including record carbon dioxide concentrations, and glacier melt, and low sea ice, continued. The World

Meteorological Organization will issue consolidated figures on 2016 global temperatures in early 2017. November data confirms WMO's assessment issued in November that **2016 will very likely be the hottest year since records began in the mid 1880s**."

December 20, 2016. **Pre-Christmas melt? North Pole forecast to warm 50 degrees above normal Thursday** by Jason Samenow, The Washington Post. "**It's not normal, and it's happening again**. For the second year in a row in late December and for the second time in as many months, temperatures in the high Arctic will be freakishly high compared to normal. Computer models project that three days before Christmas the temperature near the North Pole will be an astronomical 40-50 degrees warmer-than-normal and approaching 32 degrees, the melting point."

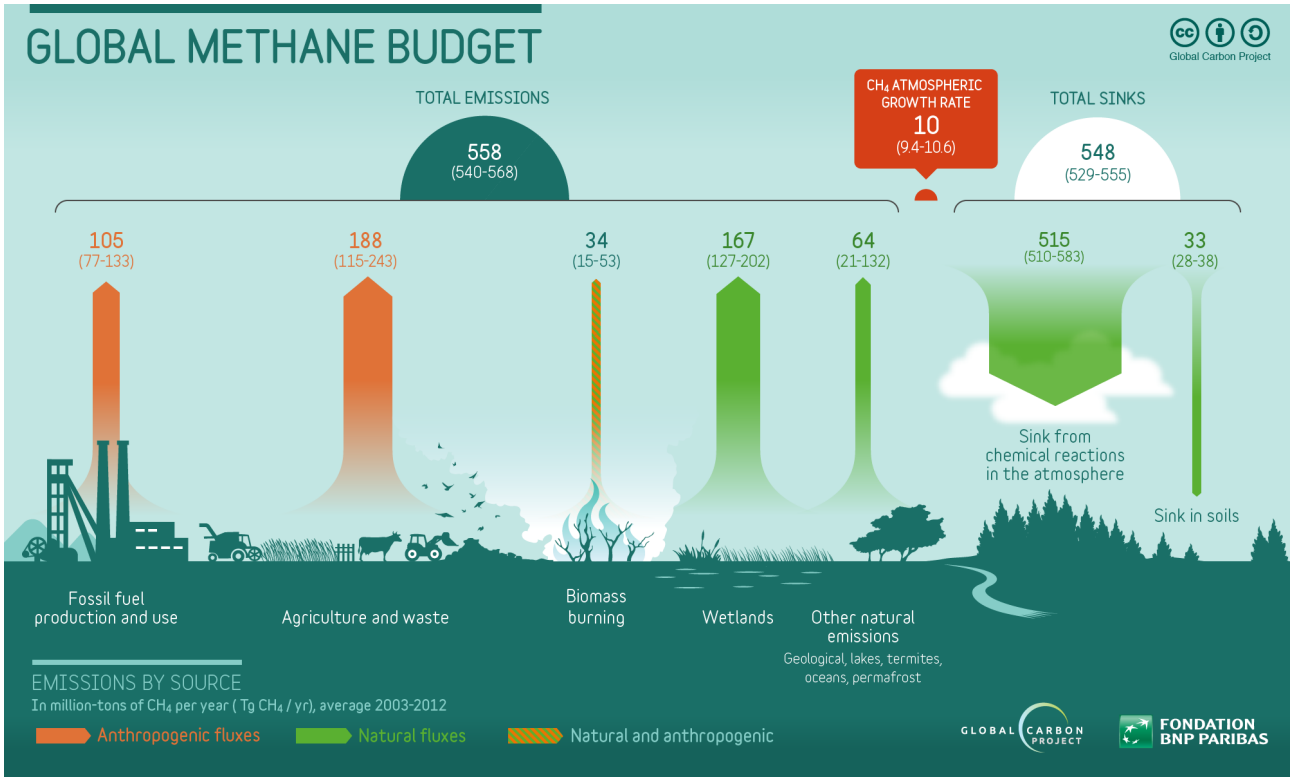
December 19, 2016. **Conversaciones con futuro | Nicholas Stern: "Los próximos 20 años serán críticos para el planeta"** por Cristina Galindo, El País. "El economista, autor en 2006 de un informe de referencia sobre el coste del cambio climático, **cree que la situación ha ido a peor, pero confía en que la tecnología ayude a evitar la catástrofe**. Nicholas Stern fue el autor principal de un informe sobre el impacto económico del cambio climático encargado por el Gobierno británico hace 10 años y que se ha convertido en un texto de referencia [The Economics of Climate Change]. Desde entonces, el hielo del Ártico ha continuado derritiéndose, las temperaturas globales no han parado de subir y los científicos han empezado a vincular las catástrofes meteorológicas con el calentamiento del planeta. Stern considera que subestimó el coste derivado de la innación ante el cambio climático: lo cifró entonces en el 5% del PIB mundial y ahora, según sus estimaciones, debe de ser notablemente mayor."

December 14, 2016. **Arctic heating up at twice as fast as rest of globe** by Mayra Cuevas and Max Blau, CNN. "The Arctic is heating up twice as fast as the rest of the world -- triggering a "massive decline in sea ice and snow," according to a new federal report (…) **The findings also revealed a change in the carbon cycle due to melting permafrost in the northern latitudes**. More carbon is stored in the permafrost than in the Earth's atmosphere. Once permafrost melts, the carbon would release into the atmosphere, which would exacerbate the effects that the greenhouse gas has on the planet as well as have effects on global weather patterns and climate."

December 14, 2016. **Global sea ice in November: Black swans flock to both poles** by Michon Scott, NOAA climate.gov. "If every swan you ever saw was white, you might think a black swan is impossible. That idea is the basis for what people in the world of commerce call a black swan event: a situation—such as the 2008 financial crisis—so rare that few people saw it coming. In the world of sea ice, November 2016 brought the kind of surprise that few sea ice scientists anticipated. Ice conditions were so unusual that Ted Scambos, the lead scientist at the National Snow and Ice Data Center (NSIDC), described them as a black swan event. In early December, NSIDC reported that **both Arctic and Antarctic sea ice extents had dropped to record lows** in November 2016. The surprise was more than just both hemispheres experiencing record-low extents. The extents were far outside the range of variability that we'd expect based on historical observations."

December 13, 2016. **Climate Change Is Mauling the Arctic Worse Than We Even Thought** by Robbie Gramer, Foreign Policy. "**Temperatures in the Arctic this year were the highest since records started more than a century ago, and are driving a decline in sea ice cover, snowpack melt, ocean acidification, and other environmental catastrophes that will accelerate the decline of the Arctic's fragile ecosystem — with potentially dire consequences for the rest of the earth**. On Tuesday, the National Oceanic and Atmospheric Administration's Arctic Research program released its annual Arctic Report Card — and it paints a bleak picture. "Rarely have we seen the Arctic show a clearer, stronger or more pronounced signal of persistent warming and its cascading effects on the environment than this year," said Jeremy Mathis, director of NOAA's Arctic Research Program."

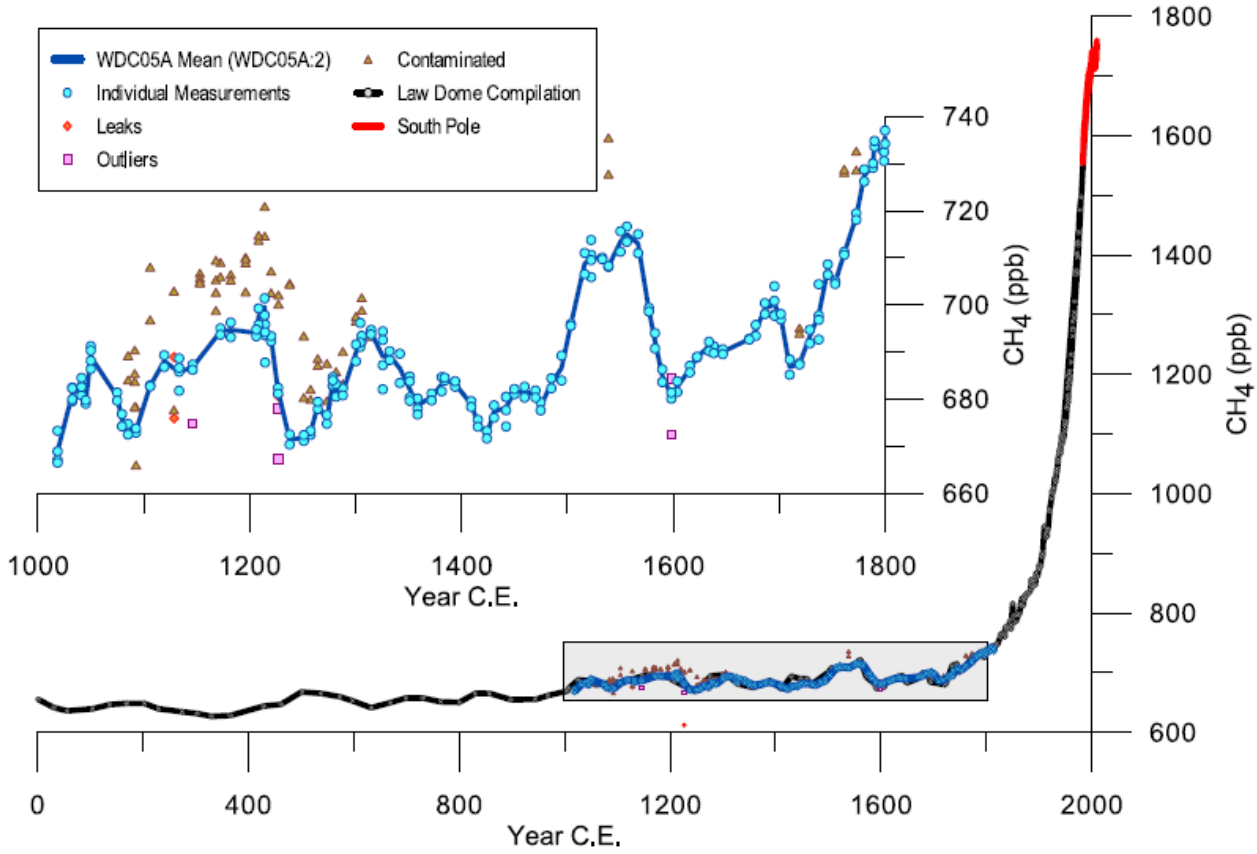
December 12, 2016. **Global Methane Budget 2016**.



December 11, 2016. **Atmospheric levels of methane, a powerful greenhouse gas, are spiking, scientists report** by Chris Mooney, The Washington Post. "The best news about climate change that we've heard lately is that for three years straight, the world's energy-related emissions of carbon dioxide, the most important greenhouse gas, have been flat. The gas has continued to accumulate in the atmosphere, but emissions haven't gone up, even as economies have continued to grow. But now we learn that there's a major dose of bad news to accompany that: What's true for carbon dioxide is not at all true for methane, the second most important greenhouse gas. Atmospheric concentrations of this gas — which causes much sharper short-term warming, but whose effects fade far more quickly than carbon dioxide — are spiking "**Methane in the atmosphere was almost flat from about 2000 through 2006. Beginning 2007, it started upward, but in the last two years, it spiked**," said Rob Jackson, an earth scientist at Stanford University who co-wrote the study (…) Overall, atmospheric concentrations of methane have grown from about 700 parts per billion in the preindustrial era to more than 1,840 parts per billion today. This suggests that much like with carbon dioxide, industrialization and modernization have had a long-term effect of unlocking large volumes of methane from the Earth. There's still far less total methane in the atmosphere than there is carbon dioxide (whose concentrations are now above 400 parts per million) — but molecule for molecule, methane packs a much stronger punch. Over a 100-year period, the emission of a given amount of methane is about 28 times as powerful when it comes to global warming as the emissions of an equivalent amount of carbon dioxide (even though the methane doesn't stay around for that long of a time period)."

December 11, 2016. **Methane from food production could be wildcard in combating climate change, Stanford scientist says** by Rob Jordan, Stanford News. "Reports co-authored by Stanford Earth scientist show **concentrations of methane approaching an internationally recognized worst-case scenario** and highlight opportunities for reducing greenhouse gas emissions from agriculture and fossil fuel use. A major opportunity for avoiding climate change's worst impacts lies in reducing methane emissions, particularly from food production, according to a pair of new studies (...) The papers were co-authored by Rob Jackson, chair of Stanford's Earth System Science

Department and head of the Global Carbon Project, which organized the work (...) **"Methane presents the best opportunity to slow climate change quickly,"** said Jackson. "Carbon dioxide has a longer reach, but methane strikes faster."



2000 year record of atmospheric methane (May 2015). Atmospheric concentrations of methane have grown to more than 1,840 parts per billion today (2016)

December 1, 2016. **Climate change escalating so fast it is 'beyond point of no return'** by Peter Walker, Independent. New study rewrites two decades of research and author says we are 'beyond point of no return'. The full impact of climate change has been underestimated because scientists haven't taken into account a major source of carbon in the environment. Dr Thomas Crowther's report has concluded that **carbon emitted from soil was speeding up global warming**. The findings [Quantifying global soil carbon losses in response to warming], which say temperatures will increase by 1C by 2050, are already being adopted by the United Nations (...) "**It's fair to say we have passed the point of no return on global warming and we can't reverse the effects, but certainly we can dampen them**," said the biodiversity expert. "Climate change may be considerably more rapid than we thought it was" (…) It found that the majority of the Earth's terrestrial store of carbon was in soil, and that as the atmosphere warms up, increasing amounts are emitted in what is a vicious cycle of "positive feedbacks". The study found that 55bn tonnes in carbon, not previously accounted for by scientists, will be emitted into the atmosphere by 2050. "As the climate warms, those organisms become more active and the more active they become, the more the soil respires – exactly the same as human beings," said Dr Crowther (...) "Our study shows that this major feedback has already certainly started, and it will have a significant impact on the climate in the coming decades. This information will be critical as we strive to understand how the climate is going to change in the future. And it will also be critical if we are to generate meaningful strategies to fight against it" (…) Prof Ivan Janssens, seen as one of the godfathers in the global change ecology field, said t**he research had provided essential data to the climate change**

model. The Intergovernmental Panel on Climate Change (IPCC), established by the UN and World Meteorological Organisation, is incorporating the study's data."

September 22, 2016. **Goodbye forever, friendly Holocene** by Johan Rockström, executive director of the Stockholm Resilience Centre, in The Guardian. "**Earth has left the geological epoch that we know and love. Now our political and economic systems must change fast to deal with the Anthropocene**. Geologists rarely make headlines. But this month the word 'Anthropocene' flooded the media following an intervention by scientists at the International Geological Congress in Cape Town. Since 2009, they have been poring over the evidence to work out whether the Earth has slipped abruptly and unexpectedly into a new geological epoch. They reached a startling conclusion: Earth has left the cosy confines of the epoch we humans know, love and absolutely depend upon – the Holocene. **This was as profound an observation as two of science's most significant discoveries – Copernican heliocentricity and or Darwin's evolution. Like them, the coming of the Anthropocene demands we rethink our world view**. No longer are we a small world on a big planet; we leave a giant footprint. When future historians look back at the 20th century, the most significant event will not be the world wars, the Cold War, the Great Depression or the end of apartheid – as important as these are. Instead, it will be the great acceleration of the human enterprise that drove Earth into a new state."

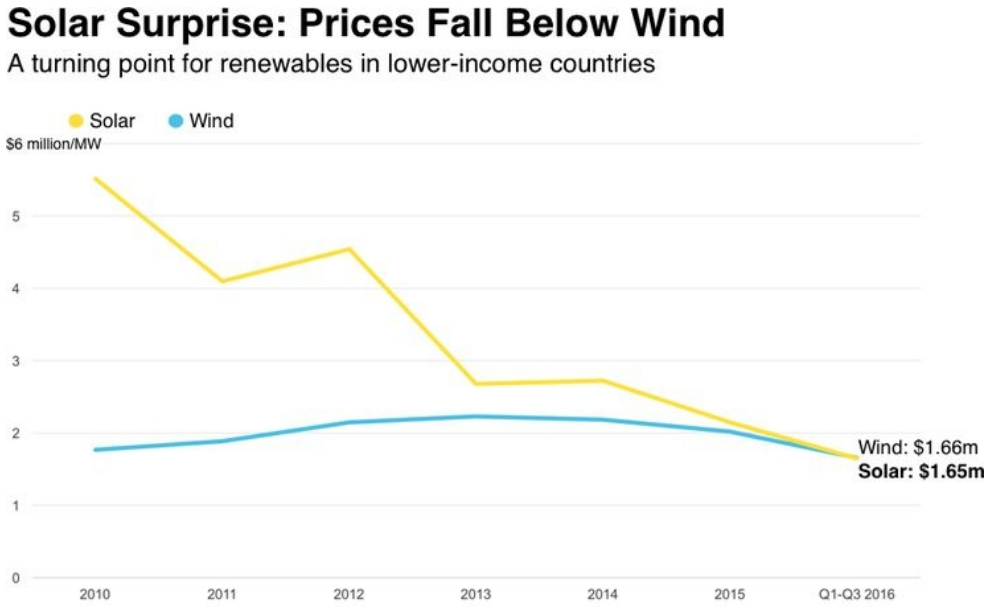
Fighting Climate Change Turned Into a Profitable Business

December 22, 2016. **A Convenient Truth - Fighting Climate Change Turned Into a Profitable Business** by Peter Vanham, World Economic Forum. "Renewable energy generation reached a tipping point, data analyses show: the cost of generating electricity from renewable sources in the last 3 years fell to levels on par or below that of coal and natural gas. Green project bond indices are now returning about 6% per year and equity returns jumped to double digits with lower volatility, while selected investment cases highlight the profitability of green energy. World Economic Forum calls investors to shift towards more green energy investments, as investments remain below what is needed to reach the Paris Accord targets, despite the tipping point. **Green energy generation has reached a tipping point**, the World Economic Forum asserts in an investors handbook. The cost of generating energy through solar and wind sources has dropped to the point of being competitive against coal and natural gas, **a paradigm shift which should attract investors worldwide to the renewables sector**. This is one of the findings of the "Renewable Infrastructure Investment Handbook: A Guide for Institutional Investors" released by the World Economic Forum. The handbook analysed data from Open Energy Information, Bloomberg New Energy Finance, S&P Indices and UNEP and other sources on the efficiency and returns of renewable energy investments, and looked at the evolution of both global investments in renewable and the specific cases of some institutions investors. "**Renewable energy has reached a tipping point - it now constitutes the best chance to reverse global warming**," said Michael Drexler, Head of Long Term Investing, Infrastructure and Development at the World Economic Forum. "Solar and wind have just become very competitive, and costs continue to fall. It is not only a commercially viable option, but an outright compelling investment opportunity with long-term, stable, inflation-protected returns (...) Read the full Renewable Infrastructure Investment Handbook here"

December 21, 2016. **Shifting to a Clean Energy Economy Would Bring Billions in Economic Benefits, Shows New Report** by Karl Hausker, World Resources Institute. "We all know the science. **The United States and the world as a whole must reduce its greenhouse gas emissions**

by 80 percent or more by 2050 in order to significantly reduce the risks posed by unabated climate change. Intensifying droughts and heat waves, inundation of coastal economies brought on by sea level rise, and increasing wildfires and extreme weather events across the United States are only some of those intensifying risks. While an 80 percent reduction may sound like a Herculean task, a new report from the Risky Business Project, From Risk to Return: Investing in a Clean Energy Economy, finds that **achieving that reduction is both technically and economically feasible—and creates a huge business opportunity**. WRI led the analysis underlying the report."

December 15, 2016. **World Energy Hits a Turning Point: Solar That's Cheaper Than Wind** by Tom Randall, Bloomberg. "Emerging markets are leapfrogging the developed world thanks to cheap panels. A transformation is happening in global energy markets that's worth noting as 2016 comes to an end: **Solar power, for the first time, is becoming the cheapest form of new electricity** (...) This has happened in isolated projects in the past: an especially competitive auction in the Middle East, for example, resulting in record-cheap solar costs. But now unsubsidized solar is beginning to outcompete coal and natural gas on a larger scale, and notably, new solar projects in emerging markets are costing less to build than wind projects, according to fresh data from Bloomberg New Energy Finance (...) The world recently passed a turning point and is adding more capacity for clean energy each year than for coal and natural gas combined. **Peak fossil-fuel use for electricity may be reached within the next decade**."



Disclosed capex for onshore wind and PV projects in 58 non-OECD countries.
Source: Bloomberg New Energy Finance

December 15, 2016. **Mark Carney, the unlikely climate champion** by Ed King, Climate change news. "Former Goldman Sachs banker is calmly, steadily steering the financial sector in a greener direction. Few world leaders have done more to warn of the potential impacts and opportunities of climate change than Mark Carney (...) "Once climate change becomes a defining issue for financial stability, it may already be too late," he told the UK insurance industry at a September 2015 event at Lloyds of London. "Climate change is a tragedy of the horizon which imposes a cost on future generations that the current one has no direct incentive to fix," he warned German business leaders a year late As chairman of the G20 nations' Financial Stability Board, Carney has overseen studies into the potential of green finance flows and the need for greater transparency on climate risk. The latter was presented in London this week in a smart but low-key launch at the Tate Modern, attended by media and representatives from banking and industry leaders. Mandated by the G20 and chaired by former New York mayor Mike Bloomberg, **the thick report may prove to be a turning point in the way the financial services sector thinks about climate change**."

December 12, 2016. **The ECB's 'quantitative easing' funds multinationals and climate change.** "Corporate Europe Observatory has decoded the list of **beneficiaries of the European Central Bank's corporate bond purchasing scheme**. The results are disturbing, unless you think oil, fancy cars, motorways, champagne, and gambling are good places to put public money. In June 2016 the European Central Bank (ECB) activated another programme intended to boost the Eurozone economy. In recent years large sums have been spent in an attempt to spur growth – so-called 'quantitative easing' – with cheap loans made available to banks, and the buying of sovereign bonds, among other measures. So far, banks have been the primary recipients. This time around, the ECB has taken it a step further and started buying corporate bonds – essentially, making cheap loans to corporations, which is fundamentally a kind of subsidy to some of the biggest players in the European marketplace. So who are the beneficiaries? Which corporations are enjoying the goodwill of the big bank? Only a few names have surfaced over the past months, as the ECB does not reveal the names of the companies, only the codes of the bonds. Now, Corporate Europe Observatory has looked them all up, and the picture that emerges is disturbing. Notably, it seems t**he ECB in its own way is helping fuel climate change, providing financial support to both oil and gas companies, and car-makers**."

December 12, 2016. **Fossil fuel divestment doubles in size as institutions representing $5 trillion commit to divest**. "The global movement to divest from fossil fuels has doubled in size since September 2015, according to the third annual Global Fossil Fuel Divestment and Clean Energy Investment Movement report from Arabella Advisors. The report, released today by the Divest-Invest network, comes exactly one year after world governments reached the Paris agreement on climate change. **Global commitments to divest have reached 688 institutions across 76 countries, representing $5 trillion in assets under management** (...) "But many institutions are moving far too slowly. That's why we will take action around the world in May 2017 through global mobilisations to shine a spotlight on the impacts of the fossil fuel industry, and escalate the call for governments and institutions to divest." **The Global Divestment Mobilisation for a fossil free world will take place between 5-13 of May, 2017**"

December 9, 2016. **ECB's quantitative easing programme investing billions in fossil fuels** by Arthur Neslen, The Guardian. "**EU emissions pledge could be undermined by bank's investments in oil, gas and auto industries**, new analysis shows (...) Unlike the European Investment Bank (EIB) or European Bank of Reconstruction and Development (EBRD), the ECB is not obliged to consider the effect that its investments may have on climate change. But the shadow climate minister, Barry Gardiner, told the Guardian: "**The European Central Bank should be aligned with Europe's industrial strategy and energy policy**. By signing up to the Paris agreement, the EU has committed to create a net zero carbon economy in the second half of the century. "Therefore the investments that the ECB supports should not undermine Europe's central policy thrust to transition its economy to one powered by clean energy."

December 7, 2016. **Laureates and scientists call on Nobel Prize Foundation to divest fossil fuels**."As laureates and scientists embracing Alfred Nobel's final words [*Nobel prizes should be awarded to those who "shall have conferred the greatest benefit to [hu]mankind"*], it is our expectation that the Nobel Foundation also act in the interest of humankind which includes caring for the health of the planet which we all rely upon." Citing the urgency of climate change, Nobel Prize winners and scientists have **issued a letter calling on the Nobel Foundation to divest its $420 million endowment from fossil fuels**. The letter coincides with the celebration of Nobel Days and the annual prize ceremonies."

December 7, 2016. **Climate change threatens ability of insurers to manage risk** by Damian Carrington, The Guardian. "Extreme weather is driving up uninsured losses and insurers must use investments to fund global warming resilience, says study (...) The analysis, by a coalition of the

world's biggest insurers, concluded that the "protection gap" – the difference between the costs of natural disasters and the amount insured – has quadrupled to $100bn (£79bn) a year since the 1980s. Mark Carney, the governor of the Bank of England, warns in the new report that: "Over time, the adverse effects of climate change could threaten economic resilience and financial stability [and] insurers are currently at the forefront." The ClimateWise coalition of 29 insurers conclude that **the industry must use more of its $30tn of investments to help fund increased resilience of society** to floods, storms and heatwaves. The Bank of England warned in 2015 that insurance companies could suffer a "huge hit" if their investments in fossil fuel companies were rendered worthless by action on climate change and some insurers have already shed investments in coal."

December 1, 2016. **Shell to tie executive bonuses to greenhouse gas goals**. "Company to screen future investments for 'long-term carbon intensity.' Royal Dutch Shell plans to link part of its executive bonuses to greenhouse gas emissions and conduct more active screening of future investments to further efforts to reduce the energy group's carbon footprint, its CEO told Reuters. **The new initiative by the Anglo-Dutch group comes in response to mounting pressure from investors to adapt to an expected flattening in oil consumption within as little as five years and international plans to phase out fossil fuels by the end of the century to combat global warming**. "We have to be at the forefront of the transition. By the middle of the century, you want to look at a portfolio that is really fit for that future," Shell CEO Ben van Beurden said."

Biomethane Opens New Phase of the Energy Transition

December 26, 2016. **2017 : l'année du GNV !** par Arnaud Bilek. "En 2016 plusieurs constructeurs ont changé de discours sur le GNV à l'image de Mercedes qui a récemment signé un accord avec GRDF en vue d'un partenariat pour la promotion des solutions de mobilité au gaz naturel pour véhicules (GNV). Pourtant, comme d'autres constructeurs, Mercedes a longtemps laissé entendre à ses clients transporteurs que le GNV n'était pas une solution prometteuse pour le poids lourd. On peut se demander ce qui explique ce soudain revirement de la part du constructeur allemand. Pourquoi en France ? Pourquoi en 2016 ? **On peut avancer au moins 4 raisons qui feront de 2017 l'année GNV en France. 1 - Les camions sont prêts** (...) **2 - Une demande en forte progression** (...) **3 - Le gaz** : une solution à 3 problèmes L'utilisation du Gaz en tant que carburant permet d'apporter une solution durable à trois problèmes majeurs de notre temps, qui vont s'accentuer dans les prochaines décennies: la nécessité d'une mobilité propre des biens et des personnes (...); la valorisation des déchets par la méthanisation. L'utilisation du GNV et la mise en place de flottes et de stations d'avitaillement sont de nature à générer une forte demande de bio Gaz. La création de ce marché ouvre des opportunités importantes et lucratives faisant de nos déchets une ressource inépuisable. Contrairement au biocarburant de synthèse qui pose un problème éthique (rouler ou nourrir : faudra-t-il choisir ?) et aux véhicules électriques qui portent en creux le débat sur une filière nucléaire dont ont ne sait pas évaluer le coût à long terme, le bio-méthane constitue une troisième voie dont les atouts et les contraintes sont bien connus; le développement économique des territoires. En mobilisant des capitaux et des emplois non délocalisables au service d'une économie circulaire favorisant l'utilisation des ressources locales, la mise en place d'une filière bio GNV est un atout pour les territoires. Ces derniers l'ont d'ailleurs biens compris, comme le démontre le grand nombre de projets en cours pour le développement de stations GNV portés par des Collectivités Locales. **4 - Une solution qui prépare l'avenir** A plus long terme, le développement du Bio GNV est également une véritable aubaine pour envisager la production et l'utilisation d'autres énergies dans un futur plus lointain. Ainsi, loin de condamner les autres énergies, le Bio GNV présente l'avantage de contribuer dès à présent à la constitution d'un mix-énergétique, le biogaz permettant

indépendamment de produire de l'électricité ou de l'hydrogène renouvelable. **Le Bio GNV est ainsi un carburant qui prépare l'avenir**, en assurant un trait d'union entre l'ancien monde du diesel et le nouveau monde de l'électrique et de l'hydrogène. C'est vrai au niveau de la distribution, mais c'est surtout vrai au niveau de la production de ces futures énergies."

December 14, 2016. **Study: RNG Fuel Use in California Transportation** by Lauren Tyler, Next-Gen Transportation. "A team from the University of California Davis conducted a study for the California Air Resources Board **examining the feasibility of producing large quantities of renewable natural gas (RNG) fuels for use in transportation in California**. As reported, the study found that t**he state could produce 14 billion cubic feet (bcf) per year of RNG by the 2020s, meeting approximately 85% of current natural gas use in California transportation** at Low Carbon Fuel Standard (LCFS) credits of $120 per metric ton of CO2. Further, the study says RNG use could be much higher if the LCFS credits were combined with U.S. federal Renewable Identification Number credits, part of the Renewable Fuels Standard. Given the appropriate policy and market measures, the state's RNG production potential is 90.6 bcf per year (approximately 750 million gasoline gallons). **Overall, it appears that the main barriers to large-scale RNG use are the state's high cost of pipeline interconnection and the cost of upgrading to pipeline standards**. The study goes on to outline how the development of alternative fuels with low greenhouse-gas and criteria pollutant emissions, such as RNG, is vital for the state of California to meet climate change and air quality goals. According to the abstract, "The study's results indicate that **there are substantial sources of RNG in California that are commercially competitive with existing fossil fuel-based transportation fuels** because carbon externalities are taken into consideration in the California market through existing programs, such as the LCFS and the Renewable Fuels Standard."

December 14, 2016. **Guide pour la mise en place d'une station-service de bioGNC agricole** par Frédéric Douard, Bioenergie International. "Les analystes ne s'y trompent pas ; une projection de l'Agence Française de l'Environnement et la Maitrise de l'Energie (ADEME) prévoit qu'**en France, en 2050, 45% de l'énergie des transports sera fournie par du Gaz Naturel Véhicule**. Dans les territoires ruraux, les agriculteurs mais aussi les collectivités sont en attente de solutions pour assurer une autonomie énergétique et une indépendance du contexte international ; là aussi, le biogaz et sa version épurée (biométhane) auront un rôle important à jouer dans un futur proche. Ce guide réalisé par Rhônalpénergie-Environnement s'est focalisé sur une problématique précise, celle du porteur de projet Dominique Ronzon. Il est agriculteur en Isère et prévoit de construire une unité de méthanisation. Il produira du biométhane qu'il injectera. Il souhaite aussi produire un carburant pour son territoire, au service des agriculteurs, de ses voisins, des entreprises locales et de la collectivité. **Il envisage ainsi d'installer une pompe de bioGNC (biométhane gazeux carburant) « à la ferme »**.

December 19, 2016. **Livre Blanc du biométhane**. "**Le biométhane est une filière d'avenir comprenant de nombreux enjeux dans la prochaine décennie** : ceux de l'indépendance énergétique nationale en matière de production de gaz, du soutien au secteur agricole en pleine crise, des développements économiques majeurs liés à la révolution du gaz vert, ceux encore de la mobilité pour leur faire comprendre que les véhicules GNV (Gaz Naturel pour Véhicules) deviennent une alternative de plus en plus crédible aux véhicules thermiques classiques." **Ici le Livre Blanc**.

December 12, 2016. **Nighttime deliveries much more efficient**. "The economic, environmental and social advantages of permitting nighttime deliveries far outweigh the added noise disturbance. That is the conclusion of a two-year extensive study in Stockholm (Sweden), which normally prohibits truck deliveries from 10 p.m. to 6 a.m. The City of Stockholm sanctioned the study, which was conducted by the Integrated Transport Research Lab at Stockholm's Royal Institute of Technology (KTH). **Scania has participated in the study by supplying a biogas delivery truck that has been programmed to operate as silently as possible** (...) It was found that average speed was 30–60 percent higher during off-peak hours compared with daytime deliveries. Drivers could thereby make more deliveries with shorter stops at each delivery point. KTH researcher Anastasios Koutoulos observed that "since we have fuel cost savings, there is no need for public subsidies. With these increases in efficiency, transport companies could save one truck in five."

December 9, 2016. **France Biométhane : un Livre Blanc pour accélerer le développement du bioGNV** par Michael Torregrossa, Gaz Mobilité. "Dans le domaine du biométhane carburant, ou bioGNV, France Biométhane émet trois propositions, pour la plupart déjà entendues dans de nombreux débats :
- **Reconnaitre le bioGNV comme biocarburant avancé**. Sur ce point, France Biométhane rappelle la directive européenne UE 2015/1513 du 09/09/2015 qui considère le biométhane comme un carburant avancé avec une réduction de plus de 95% des émissions de CO2 comparativement aux carburants fossiles.
- **Prendre en compte le caractère décarboné du bioGNV dans la TICPE**. Une mesure que réclame la filière depuis plusieurs mois. « Il s'agit d'instaurer un montant de TICPE sur le gaz reflétant son contenu carbone » explique le rapport, invitant les autorités à l'exonérer de fiscalité carbone et rappelant l'efficacité des mécanismes de garantie d'origine qui assurent la traçabilité du biogaz et attestent de sa provenance pour le différencier du GNV.
- **Soutenir les transporteurs dans leur transition** à travers la reconduction du surarmortissement actuellement en place jusqu'à fin 2017 pour les véhicules dont le poids est supérieur ou égal à 3.5 tonnes. Comme le suggère déjà le rapport parlementaire de Delphine Batho, France Biométhane appelle également à la mise en place d'aides complémentaires que ce soit à l'échelle nationale sous forme de bonus et/ou locale pour l'acquisition de véhicules fonctionnant au GNV et au bioGNV."

December 9, 2016. **Le biométhane s'invite dans l'élection présidentielle** par Thomas Blosseville, Environnement Magazine. "Fiscalité carbone, simplification administrative, soutiens financiers… Le think tank France Biométhane a entamé une série de rencontres avec des responsables politiques. Dans un Livre blanc, il formule 10 propositions pour développer le biométhane en France. Il n'a pas encore un an d'existence, mais il a décidé d'entrer de plain-pied dans le débat électoral. Le think tank France Biométhane veut placer au centre du débat politique les sujets de l'indépendance énergétique, de la crise du secteur agricole, du développement économique, des alternatives à l'essence et au Diesel."

December 9, 2016. **«Le biométhane ouvre une nouvelle phase de la transition énergétique»** par Frédéric De Monicault, Le Figaro. "Cédric de Saint-Jouan, président du think tank France Biométhane, décrypte les enjeux relatifs à l'essor de la filière. France Biométhane, le think tank réunissant industriels, agriculteurs, banquiers et universitaires, sort un livre blanc consacré au

développement du gaz vert. Son président Cédric de Saint-Jouan souligne les ressorts de cette initiative. France Biométhane a entamé un tour de France des pouvoirs publics dans le but d'impliquer nos politiques, de promouvoir et d'évoquer avec eux cette filière d'avenir qu'est le biométhane et surtout d'en faire comprendre les nombreux enjeux dans la prochaine décennie: ceux de l'indépendance énergétique nationale en matière de production de gaz, du soutien au secteur agricole en pleine crise, des développements économiques majeurs liés à la révolution du gaz vert, ceux encore de la mobilité pour leur faire comprendre que les véhicules GNV (gaz naturel pour véhicules) deviennent une alternative de plus en plus crédible aux véhicules thermiques classiques, et d'arriver à cet objectif ambitieux de 10% de gaz dans la consommation totale de gaz en 2030 (...) Avec un objectif ambitieux de 10% de la consommation française de gaz à l'horizon 2030, **la France ouvre une nouvelle phase de la transition énergétique en faisant entrer le renouvelable dans le gaz**. Cinq ans exactement après le lancement de la filière avec la sortie des tarifs d'obligation d'achat en novembre 2011, un premier bilan s'impose: les 24 unités d'injection gaz en service produisent annuellement 0,3 térawattheures (TWh). Ce sont pour deux tiers des unités portées par des groupements d'agriculteurs, pour les autres des unités conduites par des collectivités territoriales à partir de boues d'épuration, d'ordure ménagères ou de décharge. À titre de comparaison, l'Angleterre qui a également instauré un tarif d'obligation d'achat du biométhane en 2011 compte aujourd'hui 75 unités qui produisent 3,5 TWh par an."

December 7, 2016. **Nuova Piattaforma Tecnologica per rendere l'Italia uno dei principali produttori di biometano** (video). "Presentata ad Ecomondo (Rimini) la nuova Piattaforma Tecnologica Nazionale biometano che riunisce settore agricolo, utility, associazioni ambientaliste, industria e trasporti per rendere l'Italia uno dei principali produttori di biometano. Sviluppata da CIB e CIC, la piattaforma trova già il supporto di associazioni NGV come Confagricoltura, Anigas, Fise-Assoambiente, Utilitalia e Legambiente."

context:

November 9, 2016. **La Piattaforma Tecnologica Nazionale sul Biometano presentata a Rimini**. "Al momento in Italia mancano ancora alcuni punti regolamentari necessari per dare il via ai progetti e sostenere l'operatività del settore. Diverse sono le azioni volte allo sviluppo della produzione del biometano: rivedere l'intervallo temporale per l'accesso agli incentivi; prevedere entro il 2030 un target annuo minimo di immissione di biometano in rete pari ad almeno il 10% del metano immesso in rete nello stesso periodo; prevedere un sistema di contabilizzazione che valorizzi la capacità delle imprese agricole e degli impianti di digestione anaerobica e compostaggio di sequestrare la CO2 in atmosfera; istituire un Registro delle Garanzie di Origine del biometano per sviluppare un mercato attivo di scambi che faccia emergere il legame di valore tra biometano ed emissioni evitate di carbonio; modificare la regolamentazione del mercato dei CIC (certificati di immissione in consumo) (...) **Secondo i firmatari della Piattaforma, l'Italia sarebbe nelle condizioni di raggiungere una produzione di 8,5 miliardi di metri cubi di biometano al 2030, non solo senza ridurre il potenziale dell'agricoltura italiana nei mercati alimentari, ma accrescendo la competitività e sostenibilità delle aziende agricole**. Ricordiamo che l'Italia è il secondo produttore di biogas europeo, dopo la Germania: a fine 2015 risultano operativi nel Paese circa 1.555 impianti biogas, il 77% dei quali alimentato da matrici agricole." .

December 5, 2016. **Renewable biomethane fuel for HGVs offers opportunity to slash road transport emissions** by CNG Fuels. "CNG Fuels recently announced the launch of renewable biomethane fuel, **the most cost-effective and lowest-carbon alternative to diesel for heavy goods vehicles, which offers fleet operators the opportunity to slash emissions**. Waitrose, John Lewis, Argos and Brit European long-distance articulated lorries are already using the fuel, which is derived from food waste, independently verified as renewable and sustainable, and approved under the Department for Transport's Renewable Transport Fuel Obligation (RTFO) scheme. Renewable biomethane is distributed through gas pipelines to refuelling stations owned and operated by CNG Fuels where it is compressed into fuel. **It is 35%-40% cheaper than diesel and emits 70% less CO2**, on a well-to-wheel basis, offering fleet operators the opportunity to cut costs and report dramatic reductions in carbon emissions (...) Justin Laney, General Manager Central Transport, John Lewis Partnership, said: "We are committed to reducing our carbon emissions and playing our part in tackling climate change. **Renewable biomethane gives us the opportunity to make our**

fleet cleaner and quieter and, with significant cost savings, there is a compelling business case to switch from diesel". CNG Fuels is targeting operators of high-mileage HGVs, who stand to make the biggest financial savings and carbon impact. HGVs account for 4.2% of UK carbon emissions and 127,000 articulated vehicles travel an average 49,000 miles a year, with many travelling much further. Its customers' vehicles typically travel 125,000 miles a year. Gas trucks cost more than diesel, but for HGVs doing this mileage fuel savings can repay the extra cost within two – three years. A typical articulated diesel HGV driving 125,000 miles a year emits 100 times more CO2 than a typical passenger vehicle, so carbon savings from switching to biomethane are significant (...) **CNG gas engines meet the latest Euro-6 air quality standards and are roughly 50% quieter than diesel engines**. The fuel is popular with drivers because it usually takes less than five minutes to refuel and the closed system means there is no risk of spillage. CNG is a common fuel in many parts of the world. In the US it has gradually displaced LNG (Liquefied Natural Gas), which uses an incompatible technology. The country has 1,729 public and private CNG stations compared with 141 LNG stations. Gas engines are now available in the US which emit virtually no nitrogen dioxide and low levels of particulates, in contrast to diesel."

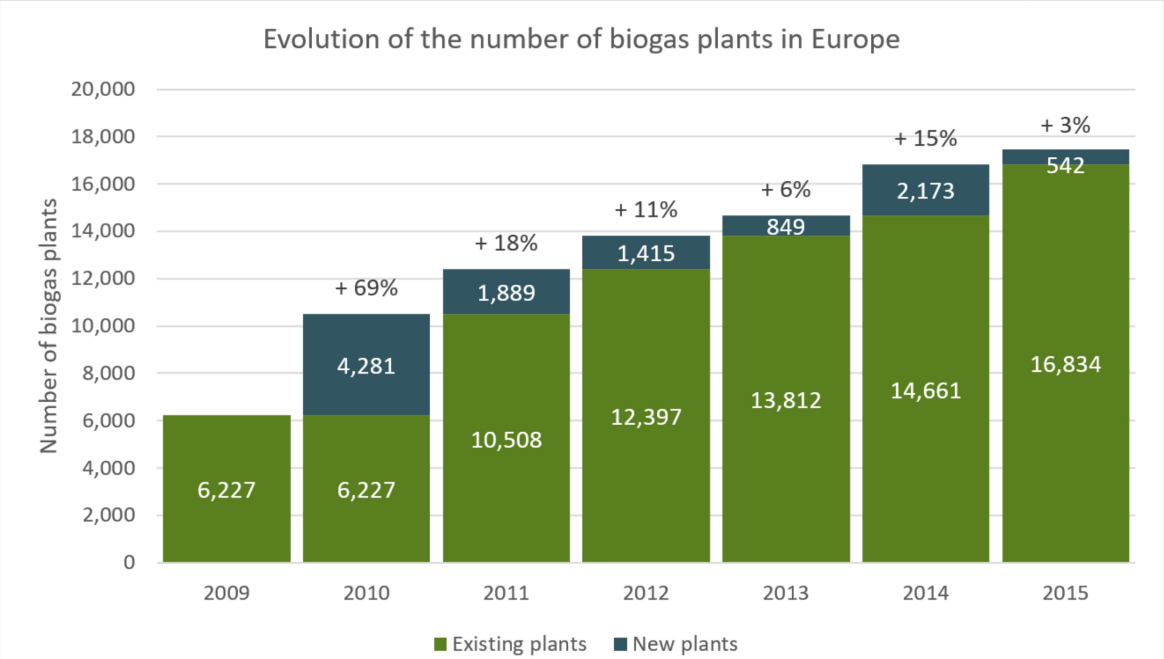
December 1, 2016. **Christmas deliveries go green as major retailers embrace renewable lorry fuel** by Madeleine Cuff, The Guardian. "Waitrose, John Lewis and Argos among the first users of a new biomethane fuel for gas-powered trucks, reports BusinessGreen."

November 30, 2016. **Who knew? VW focus on CNG / BioCNG being a better choice today than EV's!** by Brad Couch, Ariel. "There seems to be only one technology choice for transportation: electromobility (electric vehicles aka EV's). But for the experts, it is clear that there will be more in the future. The Volkswagen Group's second main pillar is natural gas propulsion. Corporate brands will expand their commitment. Attractive CNG vehicles are a factor here. Dr. Jens Andersen, Group CEO for Natural Gas Mobility with Volkswagen, explains in an interview why Volkswagen sees a great future for this drive. Follows Interview with Dr. Jens Andersen."

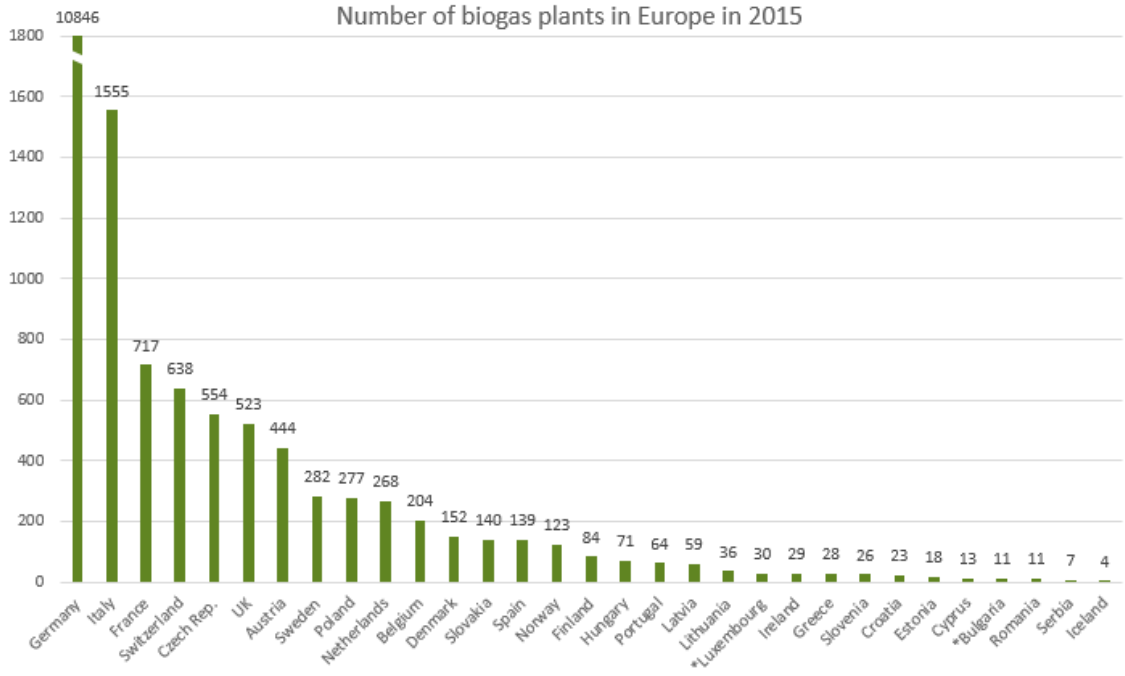
Global Anaerobic Digestion Industry Set to Reach $1trn

December 23, 2016. **El biogás europeo frena su crecimiento**. "**Un 3% en 2015** frente a un 15% en 2014. Esta es la diferencia en el crecimiento en el número de plantas de biogás en Europa entre los dos últimos años. **Nunca había crecido tan poco desde que la Asociación Europea del Biogás (EBA) publica sus informes estadísticos anuales. Sin embargo, este freno al crecimiento puede estar motivado por una mayor concentración de la tecnología y los esfuerzos en las plantas de biometano, que mantienen un ritmo de crecimiento más lineal**. España, que sigue en el pelotón de cola del biogás europeo, no aporta nada relevante ni en el biogás convencional ni en el biometano dispuesto a cargarse en vehículos y redes de gas (...) En cuanto al número total de instalaciones de biogás, se ha pasado de las 16.834 de 2014 a las 17.376 de 2015, con un incremento de 542 nuevas. El **dominio de Alemania en este apartado es aplastante, con 10.846. Es decir, seis de cada diez plantas europeas están ubicadas en este país** (...) La información sobre las plantas **en España** es confusa, y de hecho no se resalta en la nota de EBA algo que debería sorprender, que es el incremento en un 150% del número de instalaciones. En el informe de 2014 nuestro país aparecía con 39 y en el actual le adjudican **139**. Desde la Asociación Española del Biogás (Aebig) explican que esta vez se suman las agroindustriales (46), las de vertedero (49), las de depuradoras de aguas residuales (28) y otras asociadas a la industria alimentaria (16). En años anteriores aparecían solo las primeras."

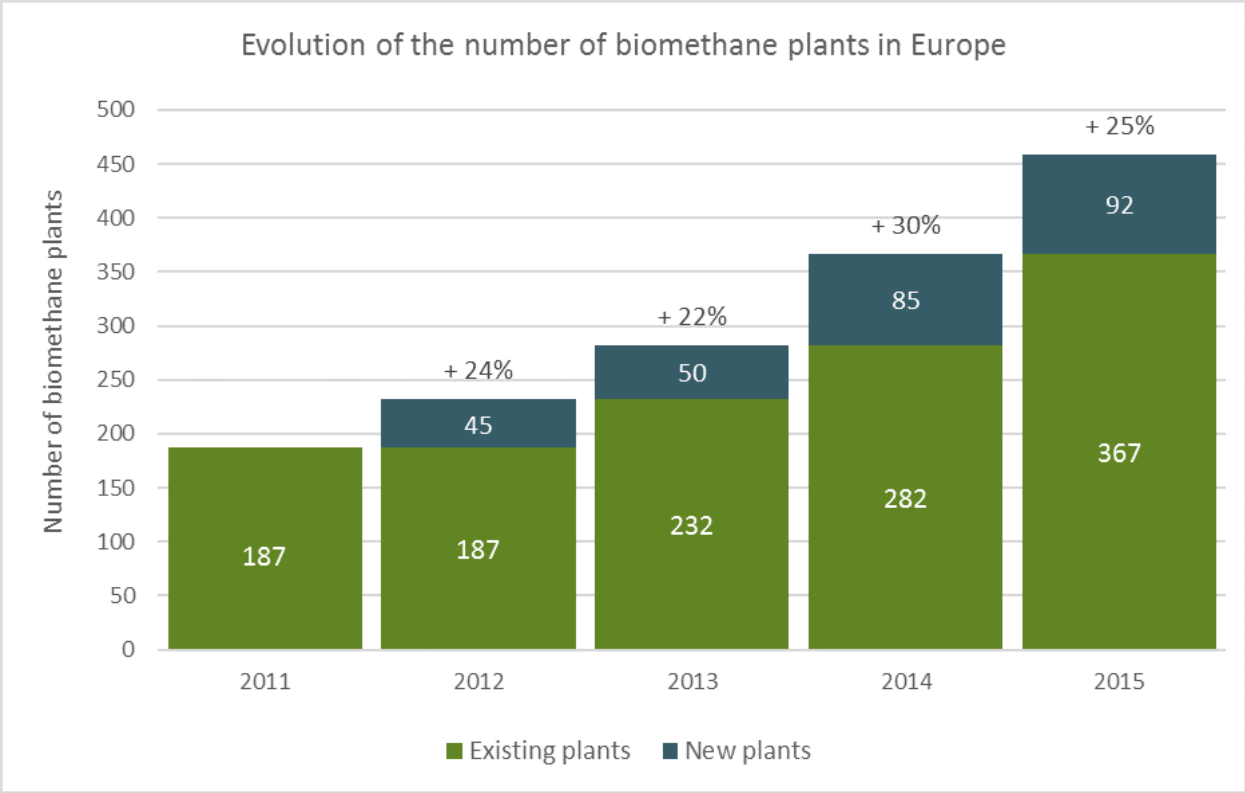
December 21, 2016. **EBA launches 6th edition of the Statistical Report of the European Biogas Association**. "According to the latest data, Europe counts 17,376 biogas and 459 biomethane plants. For the past six months, the EBA team has joined efforts to compile its yearly Statistical Report on European anaerobic digestion industry and markets. This comprehensive analysis is sourced from national associations, national statistical reports and EBA experts' own research.



This edition reflects the **steady growth in the biogas sector, with the number of biogas plants practically tripling in only 6 consecutive years, reaching the current 17,376 biogas plants and 459 biomethane plants in operation in Europe (in late 2015)**. The number of biogas plants in Europe increased from 16,834 to 17,376 in 2015 (+3%). Some countries achieved significant increase such as the United Kingdom (77 additional plants, 17% growth), Belgium (20 additional plants, 11% growth) and the Netherlands (16 additional plants, 6% growth). In terms of biogas production, national associations and third-party observers quantify the total amount of electricity produced from biogas at 60.6 TWh, a number that corresponds to the annual consumption of 13.9 million European households.



In 2015, there were 92 new biogas upgrading units commissioned which continues the steady growth of the biomethane sector. Germany remains a leader in the sector, with 185 biomethane plants. A few countries achieved significant growth, such as the United Kingdom (43 new plants), France (12 new plants), Switzerland (11 new plants), Germany (7 new plants) and Denmark (6 new plants). These numbers reflect a clear development in Europe, showing that **the biogas industry is a mature one**, capable of withstanding less profitable times while able to successfully seek for opportunities in the meantime. It can be then expected that these positive trends will continue in the short future."



December 21, 2016. **Contribution of Anaerobic Digestion and Biogas towards achieving the UN Sustainable Development Goals** by World Biogas Association. "In September 2015, the United Nations (UN) adopted 17 aspirational Sustainable Development Goals (SDGs) and 169 targets to end poverty and hunger in all its forms, protect the planet from degradation, ensure prosperous, fulfilling and peaceful lives for all to be realised through a global partnership. Further in December 2015, 195 countries met at the United Nations Framework Convention on Climate Change (UNFCCC) in Paris and made legally binding commitments to reduce GHG emissions to keep the heating of global temperature to less than 2°C, but with a target of less than 1.5°C. Those commitments were ratified by enough nations in October 2016, including the USA, China, India and the EU, to have legal force and therefore to compel countries to take GHG reduction measures within a set time frame. The Paris Agreement came into force on 4 November 2016. According to the UN Environment Programme (UNEP), current commitments made by governments are only sufficient to keep warming below 3°C and, therefore, urgent action is required if we are to avoid dangerous levels of global warming. Anaerobic digestion (AD) and biogas technologies make a significant contribution to these targets and goals, not only through generating ultra-low carbon energy and biofertiliser, but also through the reduction of harmful methane emissions from food and farming wastes, providing energy and food security, improving waste management and sanitation, and reducing poverty and hunger. This paper presents the evidence to support the need for wide adoption of anaerobic digestion and biogas technologies in order to meet the UNFCCC COP 21 Commitments and UN Sustainable Development Goals. **With the ability to reduce global GHG emissions alone by close to 20%, the potential of these technologies to contribute to a sustainable and carbon neutral future is immense**."

December 19, 2016. **A-maize-ing Victory For UK Soils** by Peter Melchett, UK Soil Association. "**The Government have heeded our advice on the destructive impact of maize and acted to reduce the subsidy for biogas maize by fifty per cent**. This is a big victory for our soils campaign. I**n a world plagued by greenhouse gas emissions from fossil fuels, I'm sure you'll agree that producing biogas from waste is a sensible, if not essential, part of the solution. Unfortunately in the UK, maize is being grown specifically for biogas production because it is easier to use than waste, but many maize crops are destroying soil, harming the environment and exacerbating floods.**"

December 14, 2016. **Mondi Paper Bag Fuels Biogas Initiative In Sweden** published by European Supermarket Magazine. "Paper and packaging company Mondi Group recently announced that it has contributed to a biogas initiative in Sweden, **producing biodegradable bags for organic kitchen waste used as fuel**. Mondi and Svenco, one of Europe's leading paper-bag manufacturers, launched a joint venture called Advantage MF EcoComp, which produces the Matavfallspåse waste paper bag that is used in Swedish households to collect organic kitchen waste. It is made of a brown specialty kraft paper produced at the Mondi Dynäs mill, produced from virgin Scandinavian pine. It is certified fully biodegradable and compostable. The water-repelling material prevents leaks while decreasing odours and letting water vapour pass through the bag, the company said. **Once it is full, the bag and its contents are sent to a biogas facility for conversion into a fuel that is then supplied to Swedish petrol stations**. One full bag can power a car for up to four kilometres."

December 2, 2016. **Sweden: Eriks Restaurants switching to renewable gas**. "**Transition to biogas has become a way to show the restaurant's responsibility, which is also highlighted by a new mark in the White Guide**. Previously, among other taverns in Swedish Brasseries; Sturehof, Riche, Teatergrillen, Taverna Brillo and Luzette taken the plunge and started **to cook the food with 100 percent green gas**. "It feels like a natural step in our sustainability work. We now go on to cook with renewable gas. Biogas has the advantage that it gives a lot of energy and have a minimal environmental impact. We want to constantly develop our work towards a more sustainable cooking and this is a step in that direction", says Linus Forsberg, CEO Erik's Restaurants. The use of biogas makes the restaurants included in a cycle in which food waste and other organic materials are utilized to produce gas. The residual product is a natural fertilizer that can be used to grow new food. "We are proud that more restaurants will move to a more eco-friendly cooking. Biogas is part of a natural cycle and is a renewable, non-fossil energy source. Interest in sustainability development is increasing, and we see that more restaurateurs are willing to contribute to it. It is obviously important as role models in the industry makes the choice to switch to biogas", says Renee Josefsson, CEO of Stockholm Gas. **Stockholm's goal for 2020 is that at least 70 percent of Stockholm residents food waste will be collected in order to get into biogas**. "

November 25, 2016. **Global AD industry set to reach $1trn**. "**With its current value set at $19.5bn, significant improvements in AD efficiency and plant operation will see the global biogas industry growing exponentially** and producing green energy more cheaply than coal, reports the Anaerobic Digestion and Bioresources Association (ADBA). The organisation also believes AD has a critical role to play in addressing some of the world's most imminent and critical challenges, including climate change, waste recycling, wastewater treatment and sanitation, and food and energy security. According to ADBA's Chief Executive, Charlotte Morton, the UK's strong research and development base – in partnership with its maturing operational sector which comprises over 540 AD plants – means the UK is well placed to take a leading role in the global AD revolution. "Improving the AD process – for example, by looking at ways to match the digestion efficiency being achieved in nature – is just one area of focus for our world-leading academic researchers," Charlotte said. "With a return to a more supportive policy environment, this could start to deliver the industry's huge potential around the world. The UK has a golden opportunity to be a global leader in what has the potential to become a $1trn biogas industry, exporting expertise and equipment worth billions of pounds, and creating tens of thousands of jobs to replace those being lost in the fossil fuel industries."