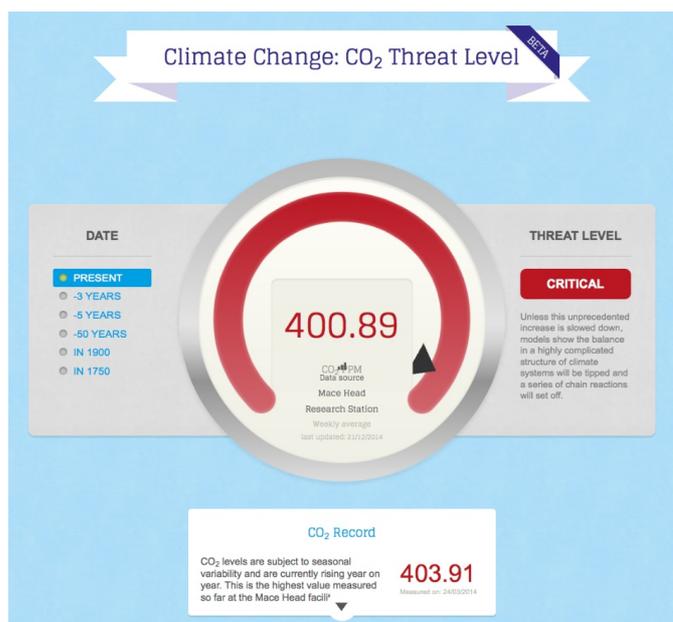




2015 need to be a turning point in the fight against climate change

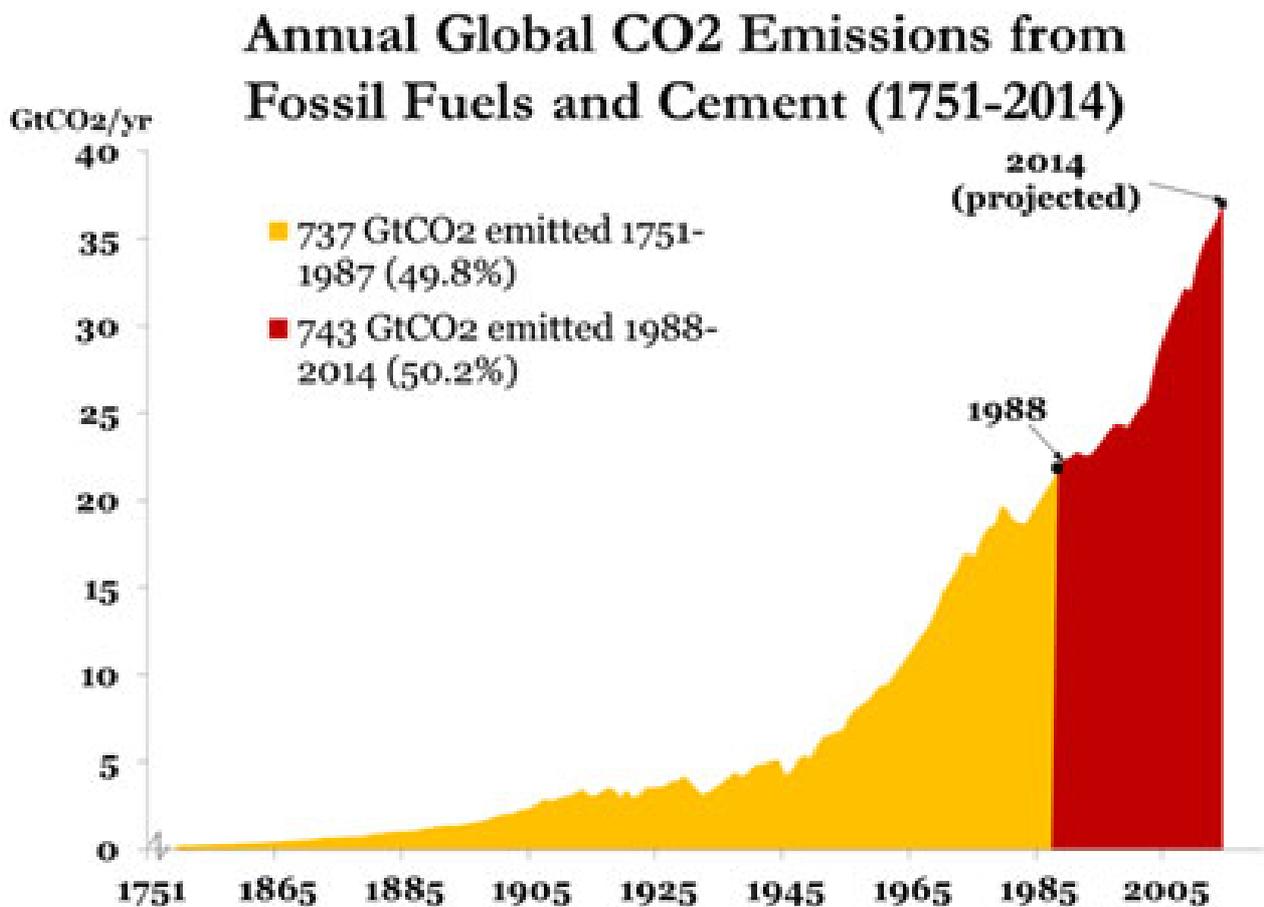
December 24, 2014. **The Switch to Renewable Power is a Battle We Cannot Afford to Lose** by Adnan Z. Amin, director general of the International Renewable Energy Agency (Irena). **The Lima climate talks saw a shift towards action with renewable energy taking centre stage.** According to the Nazca Climate Action portal, 319 cities and 261 companies are taking action on climate change. Of the 913 total actions recorded so far, 402 relate to energy efficiency and 242 relate to renewable energy. Private sector initiatives – such as RE100 and the Global Investor Statement on Climate Change – have also emerged to encourage businesses and investors to phase out fossil fuels in favour of renewable energy. National governments are following suit. The list goes on, including 144 countries with renewable energy targets, 50 countries supporting a total phase-out of carbon emissions by 2050 and 100 countries supporting zero emissions by 2100. This action, and the hope it generates for an attainable solution to climate change, is being partly fuelled by the increasingly strong business case for renewable energy. **Renewable energy is now the most cost-competitive source of power in many parts of the world.**

December 19, 2014. **Climate-KIC** recently launched its interactive **CO₂ Threat Level Indicator** daily updates to visualise the rising carbon dioxide (CO₂) levels in our planet's atmosphere and make scientific information accessible to a wider audience. Although CO₂ levels vary from month to month as Earth goes through its seasonal cycles, carbon levels increase rapidly year-on-year. Atmospheric carbon dioxide levels now regularly hit once unheard-of levels of over 400 PPM (parts per million), highlighting the upward trend of global CO₂ levels. **Scientists warn that 450 PPM is a maximum level** beyond which the effects of climate change become irreversible. A large portion of CO₂ that is being emitted now, will still be in our atmosphere 10,000 years from now.



December 15, 2014. **Global Warming Fact: More than Half of All Industrial CO₂ Pollution Has Been Emitted Since 1988** by Peter Frumhoff, Union of Concerned Scientists. The Global Carbon Project estimates that **in 2014, we will release a record 37 gigatons of carbon dioxide to the atmosphere from burning coal, oil, and natural gas, and manufacturing cement.** By the 1950s, leading scientists had become concerned about the potential impacts of rising atmospheric levels of carbon dioxide from burning fossil fuels. By the 1960s and 1970s, they were communicating these concerns to U.S. Policymakers. But 1988 is the year in which the scientific evidence for and risks of human-caused climate change became widely known, and when initial steps were taken to address the problem (...) And it is the year when the Intergovernmental Panel on Climate Change (IPCC) was established to provide international policymakers with ongoing scientific information on the issue. In short, **1988 is a milestone year** because by then policymakers and the fossil energy industry surely knew enough about the climate risks from the continued reliance on fossil fuels to begin to invest in the process of making the necessary transition to low-

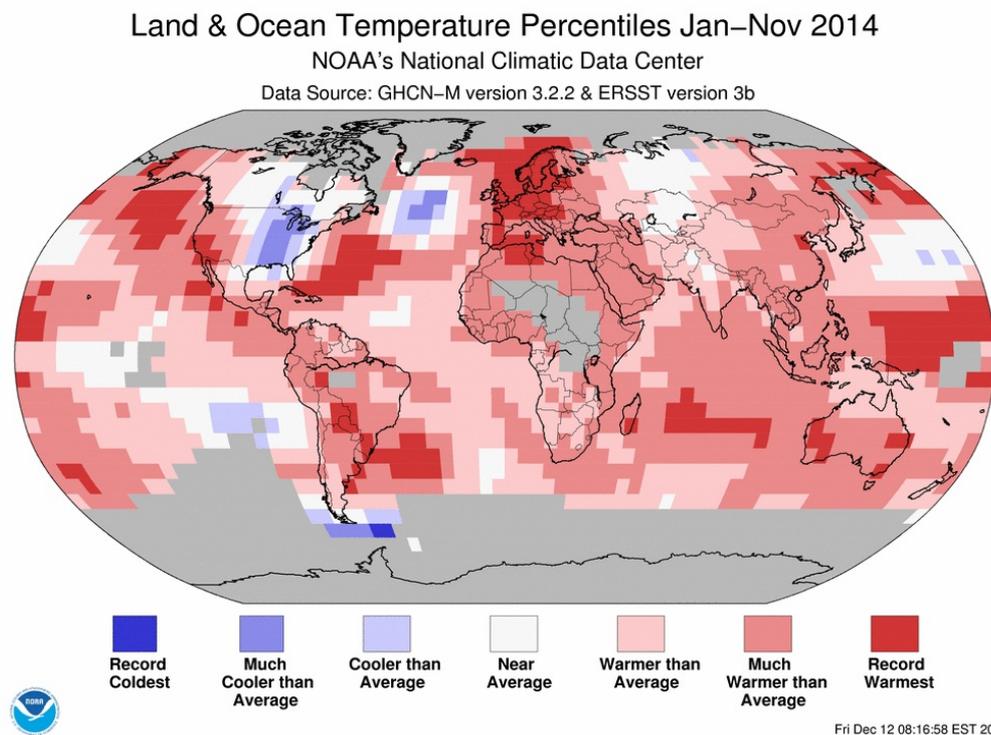
carbon energy. Instead, far too many chose to invest instead in casting doubt about the scientific evidence of climate change and to avoid limits on heat-trapping emissions — and continue to do so today. **Much time has been lost since 1988. Today the task of reducing carbon emissions is far greater and more urgent. We can't afford to lose any more time.** Climate responsibilities don't fall to governments alone. Divestment campaigns and shareholder actions are now shining a bright spotlight on the responsibilities of fossil energy companies (...) Recently published data show that just 90 entities have produced the fossil energy responsible for 63 percent of the world's industrial emissions of CO₂ and methane; of these, 50 are investor owned companies. As the scientific evidence became clear, many of these investor-owned companies sought sow doubt about the science linking their products to global warming, and today are seeking new and increasingly carbon-polluting sources of fossil fuels. It is still possible for these companies to contribute productively towards a solution. Significant progress in reducing emissions



and limiting climate change could be achieved if companies 1) unequivocally communicate to the public, shareholders and policymakers the climate risks resulting from continued use of their products, and therefore the need for restrictions on greenhouse gas emissions; 2) firmly reject contrary claims by industry trade associations and lobbying groups; and 3) accelerate their transition to the production of low-carbon energy. Evidence from history strongly suggests that a heightened societal focus on their climate responsibilities may hasten such a transition.

December 15, 2014. [January –November 2014 was warmest such period on record for globe](#) (NOAA, National Oceanic and Atmospheric Administration). The globally averaged temperature over land and ocean surfaces for November 2014 tied as the seventh warmest for the month since record keeping began in 1880, according to NOAA scientists. The January–October combined

global land and ocean average surface temperature was the warmest such period on record, surpassing the previous record set in 1998 and 2010.

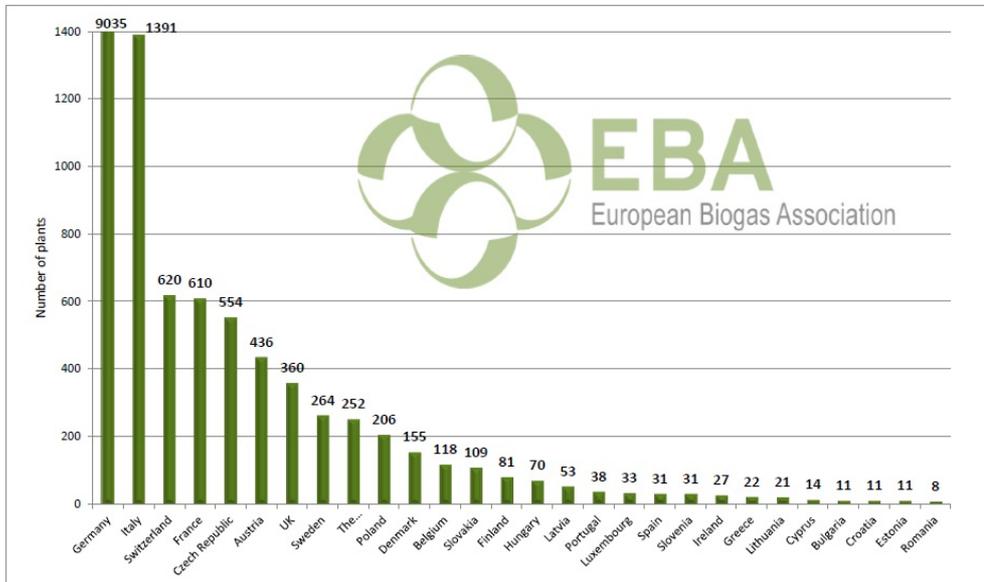


December 1, 2014. **Research confirms how global warming links to carbon emissions.** Research has identified, for the first time, how global warming is related to the amount of carbon emitted. The results show **every million-million tonnes of carbon emitted will generate one degree Celsius of global warming.** They also show that the build-up of carbon emitted over the last 200 years will then last for many centuries to millennia, even if carbon emissions are subsequently phased out.

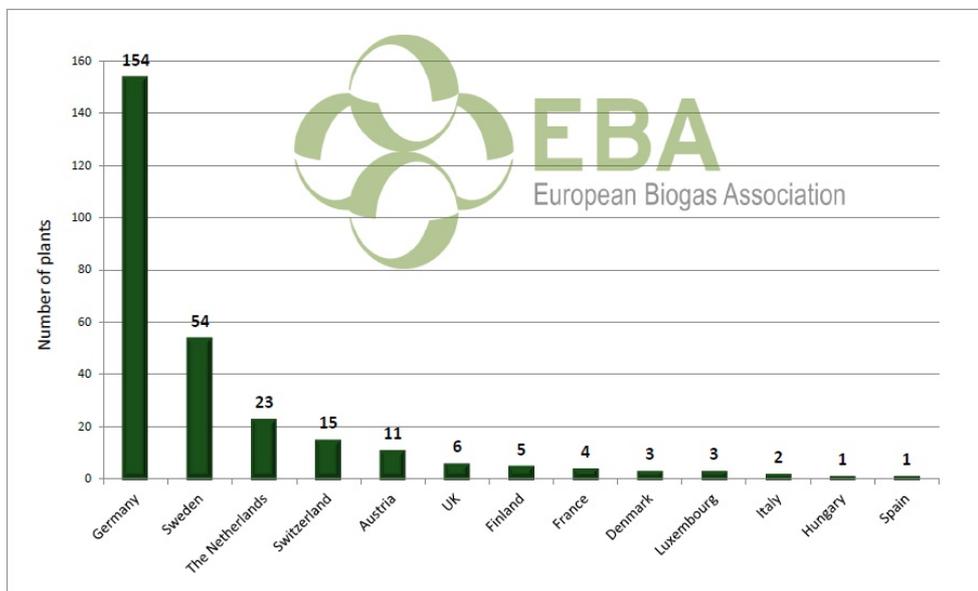
European Biogas Report 2014

December 16, 2014. EBA (European Biogas Association) publish **Biogas Report 2014**. “The combined amount of electrical and thermal energy produced today from biogas in Europe corresponds to the annual consumption of the households in Belgium and Slovenia put together. Such a production could replace 15 coal power plants with an average capacity of 500 MWe!” – are some of the conclusions of the recently published Biogas Report 2013, by the European Biogas Association (EBA). However, stagnation is observed in some of the biggest biogas contributors, such as Germany and Italy – and the forecasts are not bright for the rest of the Europe either, as crucial changes in support schemes are expected or are taking place already. EBA will further work to ensure continuous growth of the **biogas-based energy in the whole continent**, as it is **extremely important for Europe’s energy security and decarbonisation**. According to the recently published EBA Biogas Report, **there are already more than 14 500 biogas plants in Europe and the number is still growing.** “The biogas industry is facing tremendous policy changes, and it is our responsibility to provide you with the most reliable data to support our member associations to do political work in your home countries, to support our scientists in their research on new technologies, and to support our companies with updated information. EBA Biogas Report 2014 is here to support the work of all of you” – said Jan Štambaský, the President of EBA – “**the dramatic change which started with the German Renewable Energy Act EEG 2012 continues to hamper**

the industry. On the other hand, the biogas industry is increasing in the other parts of Europe – UK, Italy and Denmark, and we hope that the rest of Europe will follow these positive developments”. **Biomethane industry followed the growing trend of biogas, reaching 282 plants across Europe with a total production of 1.375 billion m³.** Utilisation possibilities are emerging, as the number of biomethane filling stations doubled in 2013 increasing the share of biomethane used in transport to 10% of the total produced biomethane in Europe.



14 563 biogas plants in Europe with total installed capacity of 7 857 MWel (2013)



282 biomethane plants in Europe producing 1.303 billion m³ of biomethane annually (2013)

context=

November 2014. [Effects of the Biogas Policy Changes in Germany: Adaptation to New Requirements](#), BioGAS+ Newsletter (p. 5-7).

Biogas and Food Security Debate

December 9, 2014. UK: [Milk in biodigesters](#). With the price farmers get for milk still falling, a farm accountant asks whether there could be a market for milk as a product to go into anaerobic digesters. Anna Hill hears from him, and puts the question to an expert from a company which builds digesters which generate energy from liquid bio-waste produced in brewing, food and dairy processing. **Is it financial viable to use milk to produce energy? And would it even be ethical?**

context=

December 22, 2014. France: [La méthanisation, une bonne solution menacée par le gigantisme](#) par Lorène Lavocat, Reporterre. **C'est une question de taille : conçue comme une industrie, la méthanisation est dommageable. Pensée à l'échelle d'une exploitation, elle peut être bénéfique pour l'environnement et pour les paysans (...)** Avec près de 8.000 unités en marche aujourd'hui, les Allemands se sont lancés bien avant nous dans l'aventure. **«Dès 2004, le gouvernement allemand a mis en place des bonus en faveur des cultures énergétiques»**, dit Aurélie Chevalier, qui travaille pour l'entreprise allemande MT-Energie. C'est que les céréales produisent en moyenne huit fois plus de méthane que les déjections animales. Résultat : **en quelques années, les champs se sont couverts de maïs. « 820.000 ha, soit un tiers de la surface agricole, ont été dédiés à la méthanisation, au lieu de produire de la nourriture »**, dénonce George Baroni, de la Confédération paysanne. Le prix des terres s'est envolé, et le pays doit même importer des aliments pour ses troupeaux. **Aujourd'hui, les Allemands mettent un coup de frein. Et la loi sur la Transition énergétique a interdit en France l'utilisation de cultures céréalières pour fournir les méthaniseurs.** Un millier de bovins, huit millions de litres de lait, et une puissance électrique de 1 .500 kW. Les proportions pharaoniques du projet des Mille vaches, dans la Somme, donnent le tournis. «M. Ramery, le propriétaire de l'exploitation, peut casser les prix du lait parce qu'il touchera un gros chèque d'EDF, déplore Jacques Pasquier de la Confédération paysanne. **La loi de transition énergétique ne fixe pas de seuil de capacité pour les méthaniseurs.** « La méthanisation doit s'adapter aux moyens et à la taille de la ferme, et pas le contraire », dit Bruno Mahé, de l'Agence locale de l'énergie des Ardennes. Un avis partagé par la Confédération paysanne, qui encourage le développement des petites unités, inférieures à 70kW. «Oui à l'autonomie énergétique des fermes, non à l'industrialisation», résume Jacques Pasquier.

December 15, 2014. [La FAO aboga por afianzar la integración entre bioenergía y seguridad alimentaria.](#)

December 8, 2014. [Q&A: How FAO and partners are working to help countries explore sustainable bioenergy development.](#) If developed in the right way, a healthy biofuels sector can help improve energy access and food security. What are the sustainability indicators that FAO and GBEP have developed and how can they be used? The GBEP indicators are unique in that they are a product of the only multilateral initiative that has built consensus on the sustainable production and use of bioenergy among a wide range of national governments (fifty) and international organizations (twenty-six).

July 21, 2014. [Running on rubbish: Supermarket comes off national grid to be powered by food waste alone.](#) "Industry partners Biffa and Sainsbury's are today celebrating an innovative facility that will allow Sainsbury's Cannock store to run on power generated solely from the supermarket's own food waste."

June 3, 2014. [Wasted supermarket food made into biogas rather than given to charity.](#) "Families are going hungry while supermarkets are paid public money to turn tonnes of surplus food in biofuel. Only two per cent of the estimated 400,000 tonnes of extra food produced by shops and restaurants each year is sent to charities, according to The Parliamentary Inquiry into Hunger and Food Poverty. The other 98% is either dumped in landfill or turned into biogas using government subsidies of up to £70 per tonne."

March 14, 2014. [How a false solution to climate change is damaging the natural world](#) by George Monbiot, Guardian. In growing maize for biogas, the crop that does most damage to the soil is being specifically exempted from the rules. "Because the anaerobic digestion of waste food and slurry makes sense, **I don't want to see a biogas moratorium imposed. But I would like to see a ban on the use of all purpose-grown feedstocks. To make biogas viable, this ban would have to be accompanied by an increase in the subsidies available for converting waste.** Yes, that means extra expense, but it's got to be a better deal than trashing the food supply, the soil, the rivers and our living rooms – all in the name of protecting the planet."

December 2011. [The Global Bioenergy Partnership Sustainability Indicators for Bioenergy.](#) Modern bioenergy presents great opportunities for sustainable development and climate change mitigation, but it brings challenges too, some of international relevance. In light of this, international cooperation is essential for building consensus on how to measure success in bioenergy and building capacity to help implement successful solutions. The Global Bioenergy Partnership (GBEP) has proved that a voluntary partnership of developed and developing countries and international organizations, informal enough to allow open discussion yet formal enough to yield meaningful results, is an effective and innovative vehicle for coordinated progress towards low-carbon, sustainable development. The 24 sustainability

indicators for bioenergy and their methodology sheets presented in this report are intended to provide policy-makers and other stakeholders with a tool that can inform the development of national bioenergy policies and programmes, monitor the impact of these policies and programmes, as well as interpret and respond to the environmental, social and economic impacts of their bioenergy production and use.

GBEP Sustainability Indicators for Bioenergy

In the **summary table** below, the set of twenty-four GBEP sustainability indicators for bioenergy, are set out under three pillars, with the relevant themes listed at the top of each pillar.

PILLARS		
GBEP's work on sustainability indicators was developed under the following three pillars, noting interlinkages between them:		
Environmental	Social	Economic
THEMES		
GBEP considers the following themes relevant, and these guided the development of indicators under this pillar:		
Greenhouse gas emissions, Productive capacity of the land and ecosystems, Air quality, Water availability, use efficiency and quality, Biological diversity, Land-use change, including indirect effects.	Price and supply of a national food basket, Access to land, water and other natural resources, Labour conditions, Rural and social development, Access to energy, Human health and safety.	Resource availability and use efficiencies in bioenergy production, conversion, distribution and end-use, Economic development, Economic viability and competitiveness of bioenergy, Access to technology and technological capabilities, Energy security/Diversification of sources and supply, Energy security/Infrastructure and logistics for distribution and use.
INDICATORS		
1. Life-cycle GHG emissions	9. Allocation and tenure of land for new bioenergy production	17. Productivity
2. Soil quality	10. Price and supply of a national food basket	18. Net energy balance
3. Harvest levels of wood resources	11. Change in income	19. Gross value added
4. Emissions of non-GHG air pollutants, including air toxics	12. Jobs in the bioenergy sector	20. Change in consumption of fossil fuels and traditional use of biomass
5. Water use and efficiency	13. Change in unpaid time spent by women and children collecting biomass	21. Training and re-qualification of the workforce
6. Water quality	14. Bioenergy used to expand access to modern energy services	22. Energy diversity
7. Biological diversity in the landscape	15. Change in mortality and burden of disease attributable to indoor smoke	23. Infrastructure and logistics for distribution of bioenergy
8. Land use and land-use change related to bioenergy feedstock production	16. Incidence of occupational injury, illness and fatalities	24. Capacity and flexibility of use of bioenergy

Milestones

December 24, 2014. Nagpur Municipal Corporation (NMC) has started the process to launch the **India's first biogas and biodiesel city buses**.

December 23, 2014. [Goteborg Energi's demonstration plant begins operations](#). [GoBiGas](#) (Göteborg, Sweden), the **world's first demonstration plant for large-scale production of biogas through the gasification of forest residues**, is now in full operation. The plant, which is the first in the world to combine large-scale gasification with methanation, has the capacity to supply about 15,000 cars or 400 buses a year with biofuels.

December 18, 2014. **Encouraging study of how sustained use of biogas reduces blood pressure and hypertension in Nepal**. More than two fifths of the world's population cook with solid fuels and are exposed to household air pollution. As of now, no studies have assessed whether switching to alternative fuels like biogas could impact cardiovascular health among cooks previously exposed to solid fuel use.

December 18, 2014. **Study identifies metal organic framework candidates for methane storage, fuels hope for natural gas cars**. Cars that run on natural gas are touted as efficient and environmentally friendly, but getting enough gas onboard to make them practical is a hurdle. Rather than shoehorn bulky high-pressure tanks like those used in buses and trucks into light vehicles, the Department of Energy encourages scientists to look at new materials that can store compressed natural gas (CNG) at low pressure and at room temperature. Cage-like synthetic macromolecules called metal organic frameworks (MOFs) are among the candidates. The advantages to using MOF as a storage medium are many and start with increased capacity over the heavy, high-pressure cylinders in current use. Lower pressures mean tanks can be lighter and made to fit cars better. They may also offer the possibility that customers can tank up from household gas supply lines.



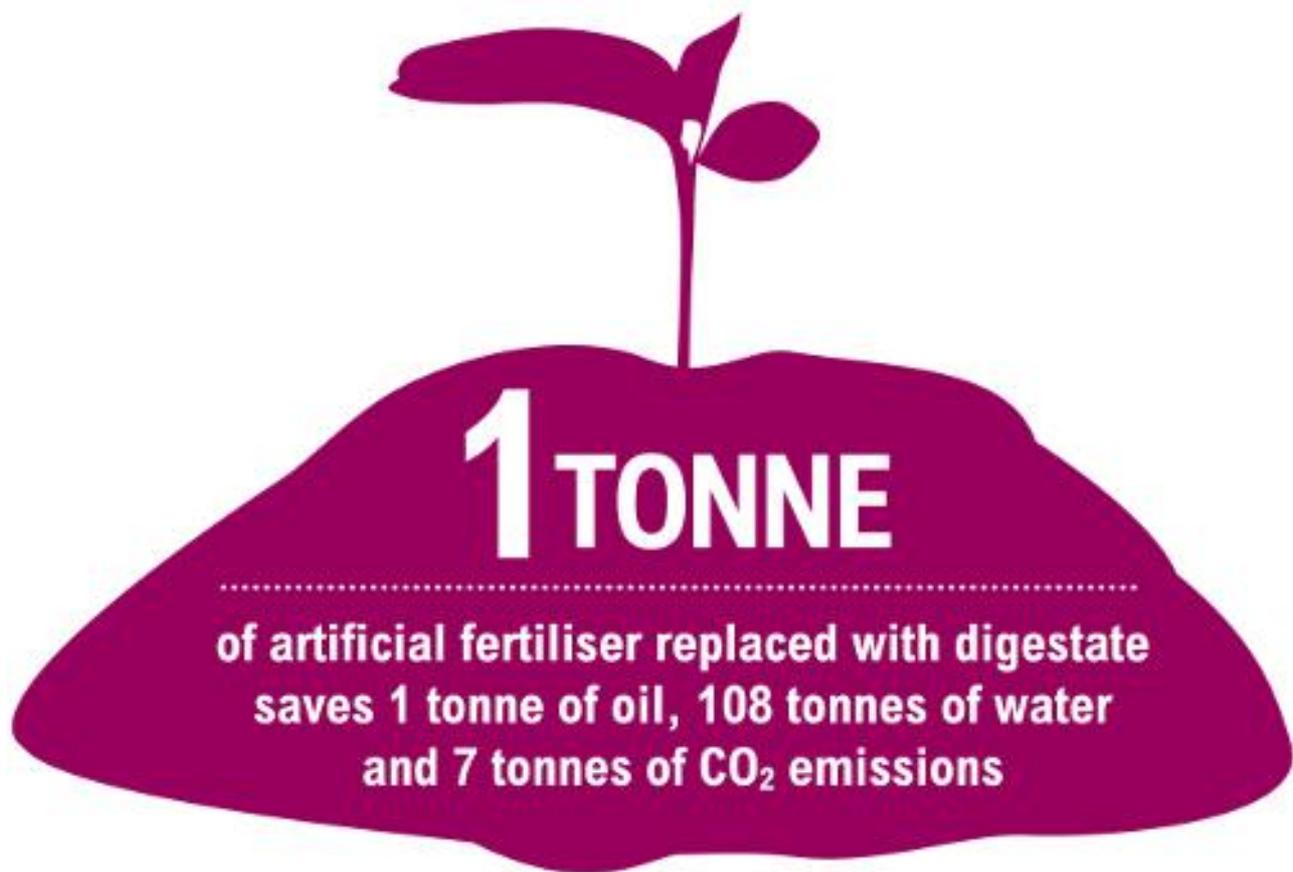
December 16, 2014. **WR Biogaz Le Mans 2016**. Welter Racing veut rouler au biogaz pour les 24h du Mans. Fidèle à ses habitudes, WR se lance dans un projet innovant, avec un prototype faisant la part belle aux nouvelles technologies et à l'écologie, le sous-titre du projet étant «La Performance Eco-Responsable».

December 16, 2014. **600,000 biodigesters installed by SNV since 1989, benefiting millions**. Over the past 25 years [SNV](#) (an international not-for-profit development organisation) has supported a biogas programme that grew from an initiative with a single manufacturer in Nepal to a sector that quickly spread across Asia, benefitting some 1.85 million people by 2009. In the years that have followed, replication of the many lessons learned across Asia led to successful biogas programmes in Africa, and in 2014 we reached the milestone of having installed 600,000 biodigesters. Improving

livelihoods is a central focus of the biogas programme. The 600,000 biodigesters installed, allowing the sanitary disposal of both human and animal waste, have vastly improved hygiene and living environments, while providing lighting and cleaner cooking facilities for 3 million people. They have seriously reduced workloads for women, allowing them to earn much needed extra income, and have shifted children's daily occupation from hours of wood collection to getting an education.

December 15, 2014. **Biogas Digester Made From Recycled Plastic**. This is the first time that this technology has been used to produce biogas digesters in Vietnam. The digesters are assembled with interchangeable modules that can be expanded if needed. They also have a self-discharge function that will reduce maintenance cost and are 20-30% cheaper than digesters made from brick or composite.

The Digestate from the Biogas Plants: From Waste to Resource



December 15, 2014. **Wavalue fertilizers vs. conventional mineral fertilizers**. A Life Cycle Analysis has been conducted to compare the production of fertilizers using the **WAVALUE PROCESS** from digestate, with the production of conventional mineral fertilizers. The results indicate that the **WAVALUE fertilizer from digestate has less than 50% of the global warming impact than the equivalent mineral fertilizer produces. This result is the same for other indexes like acidification, human toxicity, abiotic resources, or Eco-Indicator 99.**

December 11, 2014. **UK AD Sees Significant Growth Says Latest Sector Survey**. Anaerobic digestion (AD) has grown significantly in the UK, according to the latest **sector survey** (ASORI), published by WRAP. **Over a million tonnes of digestate were reported to have been applied to agricultural land in 2013**, providing benefits in terms of readily available nutrients and potentially

lower use of inorganic fertilisers. This represents 98% of the digestate for which a use was reported in the survey and highlights the importance of a 'land bank' to which to spread digestate, particularly for commercial AD operators. **Many respondents reported that they were supplying material free of charge or having to pay for it to be used.**

December 11, 2014. [Neiker-Tecnalia unveils a pilot plant that converts the organic waste from biogas plants into high quality fertilizers.](#) The Neiker-Tecnalia Basque Institute for Agricultural Research and Development has unveiled **a pilot plant that transform the organic matter from biogas plants into fertilizers with high value added.** This will bring that organic material full circle without waste being generated and it will also provide it with a commercial outlet. Digestate is the raw material for this innovative treatment plant. The result is a broad range of high-quality fertilizers in different formats, such as micro-granules from 0.5 to 1.5 millimetres in diameter, which can attain a production equivalent to the conventional one but with doses nearly ten times lower. Furthermore, the fertilizers developed by Neiker-Tecnalia will release their nutrients slowly. This means a smaller impact on the environment and they are highly suited to use for sports turf, ornamental crops and particularly delicate agricultural crops.

December 11, 2014. [NEIKER presenta una planta de transformación de residuos orgánicos en fertilizantes de alta calidad.](#) El **proceso de transformación del digestato en fertilizante comercial**, diseñado por [EKONEK](#), tiene dos pasos básicos. En primer lugar, el digestato se mezcla con otros residuos orgánicos y otros fertilizantes minerales con el fin de ajustar los niveles de NPK (Nitrógeno, Fósforo y Potasio) a valores comerciales. En segundo lugar, la mezcla resultante del primer paso, de consistencia líquida y pastosa, es introducida en un secador con un caudal de aire caliente que seca la materia y la transforma en microgránulos de gran calidad, libres de fisuras y de polvo. Obtener un producto en forma de pequeños granos supone importantes ventajas para su transporte, almacenamiento y utilización práctica. Los técnicos de NEIKER-Tecnalia han analizado la viabilidad comercial de este proyecto y concluyen que puede ser comercializado con un precio de entre 100 y 500 euros por tonelada, según el abono concreto. Este precio de venta posibilita plazos de retorno atractivos a la inversión. Los expertos calculan que una instalación a gran escala puede tratar anualmente unas 28.000 toneladas de digestato, que dan lugar unas 9.200 toneladas de abono. NEIKER-Tecnalia pretende con la planta piloto de Arkaute aportar soluciones al sector agrícola que sean respetuosas con el medio ambiente y que, al mismo tiempo, resulten económicamente viables. En este caso, **se proporciona salida comercial al digestato de las plantas de biogás, una materia que en muchas ocasiones es considerada y tratada como un residuo.**

December 11, 2014. [WAVALUE: un nuevo proceso para producir fertilizantes comerciales a partir de digestato de plantas de biogás.](#) [WAVALUE](#) es un proyecto apoyado por el programa CIP ECOINNOVATION de la Comisión europea, cuyo objeto es el desarrollo de fertilizantes comerciales granulados a partir de digestato de plantas de biogás. En el proyecto, se ha construido una planta semi-industrial de **secado y granulación de digestato basada en la tecnología Souted Bed Drying**, en Arkaute (cerca de Vitoria), en la que se han desarrollado diversos fertilizantes comerciales, con contenidos NPK desde 9-2-2 hasta 11-15-11. También se han desarrollado análisis de ciclo de vida, estudios de mercado y estudios de viabilidad económica que integran la producción de biogás y la producción de fertilizantes..

December 10, 2014. [Common statement of FEAD, ECN and EBA on specific requirements for the inclusion of organic fertilisers and soil improvers in the EU Fertilisers Regulation.](#) FEAD (European Federation of Waste Management and Environmental Services), ECN (European Compost Network) and EBA (European Biogas Association) represent European producers of organic fertilisers, soil improvers and growing media (e.g. compost, digestate, manure) derived from animal and vegetable matter.

November 28, 2014. [EBA's position on Digestate within the Nitrates Directive](#). The European Biogas Association (EBA) acknowledges the efforts that the Nitrates Committee has made to protect our water resources from environmental damage. EBA is aware that nutrients in manure are organically bound and only slowly become available for plant uptake ("slow release") causing nitrogen leeching, therefore we consider that a maximum limit for manure in Nitrate Sensitive Zones of 170 kg/ ha nitrogen is a necessary measure. However, the need for "quick release" fertilisers is pushing farmers to purchase large quantities of costly mineral fertilisers which have a very big carbon footprint. Within this context, **EBA sees a unique opportunity to save farmers money, radically reduce GHG emissions coming from mineral fertilisers and assure a high standard of water protection. By exposing animal manure to anaerobic digestion** (natural process), a large part of the "slow release" organic nitrogen is mineralized and converted into "quick release" mineral nitrogen (predominantly NH₄-N). Therefore digestate, the product of anaerobic digestion, enjoys higher nutrient use efficiency, what greatly reduces the risk of eutrophication, while at the same time it allows farmers to use a cost-efficient and environmentally friendly option to conventional mineral fertilisers.

Applied Nanoparticles to Biogas Production

December 16, 2014. [Fundación Repsol entrega los galardones a los seleccionados en la tercera convocatoria del Fondo de Emprendedores](#). El Fondo de Emprendedores de Fundación Repsol es el primer fondo privado en el campo de la eficiencia energética en España, que nació en 2011 con el objetivo de hacer aflorar y atraer talento, y de impulsar proyectos y empresas innovadoras que aporten mayor sostenibilidad en la búsqueda, producción y uso eficiente de la energía. El Fondo de Emprendedores es pionero y singular, ya que además del soporte económico, acompaña al emprendedor durante la incubación con tutores y asesores tecnológicos expertos y se le proporciona formación en diversas disciplinas para consolidar su proyecto empresarial. Fundación Repsol ha seleccionado seis proyectos empresariales en el campo de la eficiencia energética y la energía a los proporcionará una dotación económica individualizada de entre 6.000 y 12.000€ al mes durante un período máximo de 24 meses. Entre los ganadores: **Biogás plus. Producción aumentada de biometano a partir de residuos orgánicos con la adición de nanopartículas de hierro**. Empresa: [Applied Nanoparticles](#).



A microscopic image showing a dense field of cells, likely yeast or bacteria, with a blue-green color palette. The cells are irregularly shaped and appear to be in various stages of growth or division.

HAPPY WINTER HOLIDAYS

APPLIED NANOPARTICLES

BioGAS⁺