

EUCERS Newsletter

Newsletter of the European Centre for Energy and
Resource Security (EUCERS)

Issue 77, July 2018

Introduction

Dear readers and friends of EUCERS,

It is my great pleasure to welcome you to this edition of the EUCERS newsletter, in which we present you with two articles.

In the first article, Thomas O'Donnell, an energy analyst and international academic, puts Germany's decision to support LNG terminals into perspective.

The second article, by University of Leeds' Adrew Sudmant and Andy Goulson, investigates how low carbon cities offer benefits beyond the environment.

Again, we would like to ask you to save the date for our next Energy Talk on 11 September 2018. An invitation will follow shortly.

As always, please feel free to keep us informed about your research projects and findings as we look to remain at the forefront of new knowledge and innovative ideas.

Thank you for your interest in EUCERS and for being part of our community.

Yours faithfully,
Thomas Fröhlich
EUCERS Newsletter Editor

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Germany backs small-scale LNG import terminals despite opposition

By Thomas O'Donnell

The German government has decided in favor of building small-scale liquid natural gas (LNG) import terminals and infrastructure. In March, Mrs. Merkel's CDU/CSU-SPD coalition, in its founding pact, pledged to "Make Germany the site for LNG infrastructure."¹ The first facility to win approval is planned for the North Sea port of Brunsbüttel, near Hamburg. This policy change is notable, as in Germany there has been wide opposition to LNG imports and use – opposition based on a raft of commercial, geopolitical, environmental or populist convictions beyond anything found elsewhere in Europe. Although the policy change had been advancing through the federal bureaucracy for over a year, top government officials had not made any particular effort to bring the issue to public attention or to drum up support. Unsurprisingly then, media and public understanding of government motivations have been less than ideal.

Two matters stand out. First, based on examination of the project(s) thus far approved, the aim of the new policy is to address long-stalled environmental and competitiveness problems in marine and heavy road transport. Second, and regardless of the first, this embrace of LNG has been attributed to Chancellor Merkel and GroKo ministers' purported alarm at the country's increasing dependence on Russian gas due to Nord Stream 2 pipeline project as Moscow persists in worrisome behavior.

The Brunsbüttel Project

The first LNG terminal to win approval from both Brussels (July 2017)² and then the federal government is "German LNG Terminal GmbH," to be located in Brunsbüttel harbor near Hamburg, with partners N.V. Nederlandse Gasunie (Gasunie), Oiltanking GmbH and Royal Vopak

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N.V. (Vopak). The plan is for a 500 million euro facility with construction starting in 2019 and to be operational Q4 2022. Open season for expressions of interest (EOI) by firms willing to contract for long term deliveries began 17 January and closed April 30,³ with positive reports of offtake interest. The terminal would receive LNG equivalent to 5 billion cubic meters of gas per year (bcm), with facilities to transfer, store and redistribute the liquid for use as maritime-bunker and road-transport fuel, and various industrial applications. This direct use of LNG as fuel, without regasification, is known as "small-scale" LNG.

The initial focus on Brunsbüttel for this is logical. From here, LNG can be shipped up the Elbe River as an inland-shipment and road-transport fuel. In addition, there is access to the Kiel Canal, the world's busiest artificial waterway, where LNG can be used or delivered into Scandinavia and the Baltic region. The global container-ship industry has an interest in converting engines to LNG fuel and the port of Hamburg handled almost 9 million cargo containers in 2017, the third highest number in

¹ "Ein neuer Aufbruch für Europa Eine neue Dynamik für Deutschland Ein neuer Zusammenhalt für unser Land; Koalitionsvertrag zwischen CDU, CSU und SPD; 19. Legislaturperiode" 12. März 2018. (Line 3335) https://www.cdu.de/system/tdf/media/dokumente/koalitionsvertrag_2018.pdf Accessed 3 April 2018.

² "European Commission approves German LNG terminal joint venture," LNG World News, 12 July 2017.

<https://www.lngworldnews.com/european-commission-approves-german-lng-terminal-joint-venture/>
<http://www.tallinnlng.com/european-commission-approval-for-gasunie-oiltanking-and-vopak-to-set-up-joint-venture-to-develop-lng-terminal-in-northern-germany/>

³ German LNG, Terminal GmbH, focused on the Brunsbüttel site near Hamburg, has partners N.V. Nederlandse Gasunie (Gasunie), Oiltanking GmbH and Royal Vopak N.V.(Vopak) <http://germanlng.com/open-season/>

Europe behind Rotterdam and Antwerp^{4,5} Earlier this year, LNG tanker trucks and bunkering ships carrying fuel from Rotterdam or other distant terminals have already transferred LNG to fuel ships (i.e., bunkering) near Brunsbüttel.⁶

However, the facility plan also includes an onshore regasification unit and connections to the existing gas-distribution network for conventional gas applications – heating, electrical generation, etc. Experts tell me they see this as giving the enterprise added resilience beyond a purely liquid-transfer facility, especially as it is expected to take time for road-transport infrastructure in Germany and demand to develop. Experts also surmised that, as this facility is not too distant from the older, low-calorific (L gas as versus H gas) pipeline system, which comes from the soon-to-be-closed Groningen gas field in the Netherlands⁷, it could perhaps substitute for some of this decreasing supply as the system (comprising 30% of all German customers) is converted to standard high-calorific gas.⁸ The size of this facility, and its functionality, while it could be expanded later, remains “small-scale”.

A caveat is in order here. At present (2018) Germany receives gas from Russia (31%), Norway (24%), Netherlands (23%), Germany (11%) and Denmark, UK and others (11%).⁹ Total annual volume was 80.5 bcm (2016). While the plan to double gas flow from Russia with the NS2 pipeline has rightfully received much attention for the potential for hyper-dependency on Russia, another major conundrum is the fact that, within about ten years, it is likely that essentially all present pipeline sources besides Norway and Russia will be very low or non-existent. This

would bring about a “duopoly” of these suppliers with considerable price leverage.¹⁰ At present there is no apparent willingness by any investors to now build a (a perhaps five-times-more-expensive than Brunsbüttel) large-scale LNG terminal in Germany. In addition, I am told by federal officials there is at present no willingness to subsidize such a facility as those presently installed at Rotterdam and Zeebrugge are now underused; and the new pro-LNG policy which is being supported is purely for small-scale introduction. However, as a Merkel Energy GmbH consultancy report indicates, there is nevertheless a likely “first mover” advantage to a facility such as that planned now for Brunsbüttel, in being well positioned for a big expansion at some future date when Germany undoubtedly will need major LNG imports.¹¹ This will especially be the case, as I would add, its nuclear will be offline, coal is expected to be largely offline by then, while the complexities of high-percentage renewable integration presents considerable grid and storage challenges. However, again, all present plans are within the scope of small-scale LNG for especially maritime and heavy road transport.

Motivations: Stalled Transportation Cleanup and the German Economy

Germany is a country with 46.1% of its GDP (2016) dependent on exports as versus 26.9% for OECD states overall and just 11.9% for the USA.¹² This imbues German competitiveness in maritime and internal heavy-road transport with special importance. Yet, in spite of having pinned the nation’s commercial future on the success of the *Energiewende*, its domestic energy transition with ambitious goals, actors from government, industry,

⁴ List of busiest ports in Europe, Wikipedia, https://en.wikipedia.org/wiki/List_of_busiest_ports_in_Europe

⁵ Port of Hamburg, statistics. <https://www.hafen-hamburg.de/en/statistics>

⁶ Brunsbüttel Ports, News. “Nauticor’s LNG bunker operation for the ‘Scheldt River’” 13 February 2018. <http://www.brunsbuettel-ports.com/article/nauticors-Ing-bunker-operation-for-the-scheldt-river.html>

⁷ Nicholas Newman, “The Great German Gas Switch-Over,” Pipeline and Gas Journal, April 2018, Vol.245, No.4 <https://pgjonline.com/magazine/2018/april-2018-vol245-no4/features/the-great-german-gas-switch-over>

⁸ Ibid., Nicholas Newman, “The Great German Gas Switch-Over,” Pipeline and Gas Journal, April 2018, Vol.245, No.4 <https://pgjonline.com/magazine/2018/april-2018-vol245-no4/features/the-great-german-gas-switch-over>

⁹ Eurostat, 2018, cited in Nicholas Newman, “The Great German Gas Switch-Over,” Pipeline and Gas Journal, April 2018, Vol.245, No.4 <https://pgjonline.com/magazine/2018/april-2018-vol245-no4/features/the-great-german-gas-switch-over>

¹⁰ Merkel Energy GmbH: Die Potenzialstudie „LNG-Infrastruktur an der deutschen Nordseeküste unter...“ 10.2017. <https://www.mariko-leer.de/wp-content/uploads/2017/10/LNG-Potenzialanalyse-Oktober-2017.zip>

¹¹ Merkel Energy GmbH: Die Potenzialstudie „LNG-Infrastruktur an der deutschen Nordseeküste unter...“ 10.2017. <https://www.mariko-leer.de/wp-content/uploads/2017/10/LNG-Potenzialanalyse-Oktober-2017.zip>

¹² World Bank, Export of goods and services, % of GDP. Latest data is 2016. https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?name_desc=true

political parties and climate/environmental institutions have remained embarrassingly stalled on actually beginning the cleanup of both air-pollution and carbon emissions in transport, a so-called *Verkehrswende* (transport transition). The continuing diesel scandal is but one aspect of this, involving passenger vehicles. However, maritime and heavy-trucking are other areas, where a sort of paralysis (related to the previously mentioned raft of objections or conditions so many actors have had towards LNG), has caused the country to fall disconcertingly behind many other European states and the USA.

For example, in California, after already some 15 years of efforts, in 2015 fully 60% of all buses were running on compressed natural gas (CNG), as were 17% of all buses in the USA. This means their engines were emitting about 90% less air pollution and 15-20% less CO₂ than diesel powered buses ubiquitous in Berlin and most German cities.¹³ However, in especially the past few years, LNG, a low-temperature cryogenic fluid, has begun to take off in especially the USA, China and parts of Europe for maritime and heavy-transport fuel, and for other high-utilization vehicles. In the USA, the Energy Information Agency expects a transformation similar to that of steam-to-diesel for locomotives in the 1950's to take place from diesel-to-LNG which is both environmentally positive and cost-reducing.¹⁴

With 600-times less volume as a low-temperature liquid than natural gas at ambient temperature, LNG has a similar energy density to diesel, yet has the emissions reductions noted for CNG, and is broadly cheaper than diesel. Its direct use as a liquid fuel, known as "small-scale LNG", is distinct from "large-scale LNG" involving much-higher volumes which are re-gasified in huge facilities and injected into the gas grid, especially for largescale electrical

generation. A summary of a study by the industry group Gas Infrastructure Europe (GIE) indicates: "As of end 2017, 75% of operational small-scale LNG infrastructures were in countries that have large-scale regasification terminals¹, mainly in Western Europe," "France, Italy, Spain and the UK have been driving the growth in small-scale LNG infrastructure, increasing [...] their operational facilities by 133% over 2016-2017, [...] in Western Europe [...]: 65% of under construction or planned projects are in countries with large-scale import terminals."¹⁵ However, in Germany, there are no small- or large-scale LNG import terminals. In 2008 the German firm E.ON dropped plans for large-scale LNG regasification facilities at Wilhelmshaven for lack of interest, as did RWE in 2011 with a similar attempt.¹⁶ However, this is finally poised to change, with Brunsbüttel and later another expected at Wilhelmshaven and another North Sea port.

Alternative Fuel for the German Transport Sector

While transport is widely seen as not only Germany's but the EU's most neglected area in meeting climate goals,¹⁷ progress is being mandated. In maritime shipping, clean-fuel regulations were adopted for the first time this April by the UN's International Maritime Organization. These require maritime shipping to cut carbon emissions by half by 2050. This is widely understood to "require the shipping industry to completely redesign their fleets around new fuels."¹⁸ Accordingly, the German maritime sector has pressed the federal government to facilitate LNG infrastructure, ¹⁹ lest it fall behind in global competitiveness. So too, for the trucking industry, Brussels is expected "to propose the EU's first carbon emissions targets in May." Here too, German business has pushed Berlin to foster infrastructure and policies needed to facilitate moving to new fuels such as LNG. Given the

¹³ Nichola Groom, "California's push for cleaner buses could edge out natural gas," Reuters, 2 July 2015.

<https://www.reuters.com/article/us-california-naturalgas-buses-insight/californias-push-for-cleaner-buses-could-edge-out-natural-gas-idUSKCN0PC0AV20150702>

¹⁴ "Liquefied natural gas shows potential as a freight locomotive fuel" USA EIA, 14 April 2018. <https://www.eia.gov/todayinenergy/detail.php?id=15831>

¹⁵ GIE releases new small-scale LNG database | LNG World News <https://www.lngworldnews.com/gie-releases-new-small-scale-lng-database/> (Note: "Small-scale LNG infrastructure is heavily dependent on the proximity of large-scale LNG import terminals.")

¹⁶ Andreas Walstad, "Germany may reconsider Wilhelmshaven LNG project" Interfax Global Energy, Gas Daily, 27 March 2014. <http://interfaxenergy.com/gasdaily/article/7458/germany-may-reconsider-wilhelmshaven-lng-project>

¹⁷ Rochelle Toplensky, "Business asks Brussels to set exacting CO2 targets for trucks," Financial Times, 18 April 2018. <https://www.ft.com/content/f27305a0-422c-11e8-803a-295c97e6fd0b>

¹⁸ Leslie Hook, "Shipping industry poised to agree first emissions target," Financial Times, April 13, 2018.

¹⁹ German maritime associations advocate use of LNG as fuel. LNG World News, 28 August 2015. <https://www.lngworldnews.com/german-maritime-associations-advocate-use-of-lng-as-fuel/>

country's high export-dependent profile, it is supremely important it does not become an LNG "desert" among other EU neighbors who have already begun to move to meet Brussels' mandates for LNG fueling stations, complicating the uninterrupted movement of road or waterway freight via Germany.

In response, the federal government and Brussels have both very recently begun providing subsidies for LNG adaptation in Germany. Last August 31, the Federal Ministry for Transport and Digital Infrastructure began a stimulus program for German ocean-going shipbuilders to either build new LNG powered ships or to convert diesels to LNG.²⁰ So too, the EU Commission's Connecting Europe Facility (CEF) gave a 3.3 million euro grant to a Berlin firm Liquind 24/7 this April, towards the cost of building ten LNG fueling stations along important trucking corridors in Germany.²¹ Germany had till very recently not established EC-mandated LNG stations and infrastructure, in contrast to neighboring countries.

To be clear, the GroKo government support for small-scale LNG is eminently rational and long overdue. Elsewhere in Europe and in the USA so-called "small-scale" LNG transfer facilities have already begun to provide a relatively simple environmentally beneficial substitute for bunker oil and for diesel fuel. In 2015, the German Energy Agency (DENA) already noted that "LNG is successfully used as road fuel in North America, parts of Europe and China. [...], more than 50,000 trucks and 1,300 filling stations are in operation."

There is no controversy that this use of LNG results in greatly reduced air pollution as versus diesel. Data from a Belgium provider Fluxys, consistent with many other sources, finds for air pollution, 99% less particulates, 99% less SO₂, 70% less NO_x and about 50% less noise pollution than diesel trucks (or locomotives). It also finds 12% less

CO₂ emissions.²² This is consistent with engine manufacturers' engine spec sheets. For example, Rolls Royce, which has many German facilities, in comparing its own diesel engines to its gas or LNG engines, finds similar air-pollution reductions but 22% less greenhouse gas emissions even including engine leakages of methane.²³ And, there is much less special infrastructure needed than many other alternative fuels. BMW, for example, reported conducting experiments in 2017 using two LNG-fueled heavy trucks to transport engines 530 km. from its plant in Steyr, Austria to its plant in Regensburg, Germany. Officials commented that electric trucks would have required multiple recharging stops, while compressed natural gas (CNG) would have required tanks three-times as large as the LNG tanks used. In contrast, the LNG trucks made roundtrips without refueling, comparable to the range of diesels.²⁴ This meant also significantly less new infrastructure investment and maintenance than would electric or CNG, needing only refueling capacity at the start location.

On the down side, LNG is not carbon free, and is likely to be only a 'bridging fuel' to other technology. A much-discussed prospect is "power to gas" whereby especially remote, "stranded" or excess electrical production from renewable electricity by wind or solar could be used to produce "renewable methane" (i.e., natural gas) or hydrogen that could be incorporated into gaseous and LNG facilities being established today with natural, fossil-fuel methane. However, this option, as well as heavy electric trucks and maritime ships are not yet feasible at scale requiring further tech breakthroughs and price reductions. So, in the interim, what has been the basis for so much opposition to import and use of LNG in Germany? The opposition has come, broadly speaking, from two camps.

The Two Streams of Opposition

²⁰ LNG World News, "Germany boosting use of LNG as maritime fuel," 31 August 2017. <https://www.lngworldnews.com/germany-boosting-use-of-lng-as-maritime-fuel/>

²¹ LNG World News, "EU funds German LNG fueling project," 24 April 2018. <https://www.lngworldnews.com/eu-funds-german-lng-fueling-project/>

²² Fluxys Belgium, "LNG as fuel for trucks" See graphic. <http://www.fluxys.com/belgium/en/About%20natural%20gas/fuelfortransport/LNGtrucks/LNGtrucks>

²³ Rolls Royce, "Diesel and gas engines" Engine sales brochure. <https://www.rolls-royce.com/~media/Files/R/Rolls-Royce/documents/marine-product-finder/diesel-and-gas-engines-brochure-1216.pdf> Compared to the equivalent Bergen diesel engines, the Bergen gas engines give E2 weighted emission reductions of 92% NO_x, close to 22% in CO₂ and virtually eliminate SO_x and particulates, already meeting enforced IMO Tier III and EPA Tier 3 requirements and are subject to EPA Tier 4 certification." p. 6; also see chart p.5.

²⁴ German Car Giant, BMW, testing LNG-powered trucks <https://mobile.lngworldnews.com/german-car-giant-bmw-testing-lng-powered-trucks/>

First Camp:

If we speak of large-scale LNG imports, intended to provide significant electrical generation, a pragmatic opposition is based on commercial calculations about Russian pipeline gas simply being cheaper in Germany; some in this camp do and many do not worry about high levels of Russian-gas dependence. Most of the latter pointedly assert that, regardless of other countries' experiences, Russian gas has been "historically reliable" for Germany and building large-scale LNG import terminals would be an "expensive" and "unnecessary" energy security policy.

This dovetails with a widespread conviction among German business and political elites that only via mutual German-Russian interdependence, especially in the energy business, can Germany ameliorate ambient geostrategic tensions. While this is a familiar tenant of Germany's Cold War-era Ostpolitik towards Russia, many in this camp will add this is a well-proven commercial and security logic with roots going back to the medieval Hanseatic League, and appropriate for what will remain a country not disposed to military might. Accordingly, repeated bad behavior by Moscow does not shake this conviction, on the contrary its necessity is felt even more so in this circumstance.

The further reality one finds in these mainly business and political circles, is a growing aversion to Transatlanticism such that, across broad business and political circles, one of the most widely effective critiques is a populist-nationalist dismissal of present sanctions on Russian energy firms as simply an "American strategy" to "promote its own LNG export business" in Europe at Germany's and Russia's expense.

Meanwhile, as is correctly pointed out, two large-scale import terminals already exist— at Zeebrugge in Belgium and at Rotterdam in the Netherlands, sufficiently nearby and with still-low utilizations that could be drawn upon in

the event of a major interruption of Russian, or for that matter Norwegian pipeline supplies. In any case, the new GroKo endorsement of LNG is not about this sort of large-scale LNG imports to provide a major addition to Germany's electrical generation.

Second Camp:

However, seemingly even more broadly, a second camp finds LNG use on any level, large- or small-scale, as antithetical to the renewable-energy goals of the *Energiewende*. Here, natural gas and LNG are often dismissed out-of-hand as "simply another fossil fuel," largely produced in the USA by "environmentally dangerous" fracking that is "banned in Germany"²⁵ so it would be "hypocritical" and/or "counter-productive" to import it.

In this camp, many additionally insist that extraction and transport of natural gas in any form, but especially via fracking, allows so much global-warming methane (natural gas) to escape as to negate any reduction in CO2 emissions gained from using natural gas as a fuel in place of coal. I should mention that scientific assessments by the International Energy Agency (IEA)^{26, 27} present serious challenges or refutation to many of the popular environmentally-motivated ideas cited above against LNG use, especially when the Agency reviewed all available studies of "methane leakage" conducted in recent years, concluding that indeed natural gas is superior to coal, and can and is being made better by better regulating leakages in its production and supply chain.

In a number of discussions in academic and institute or political events earlier this year in Germany, I found the idea of distributing LNG in liquid form, without re-gasifying it, in order to provide a maritime or heavy-trucking fuel, or for city busses and etc. in place of diesel (i.e., "small-scale" LNG) strongly opposed. Further, in response to my inquiries, representatives of major international energy companies in the past year described

²⁵ The Federal Government, "PACKAGE OF REGULATIONS COMES INTO FORCE. No fracking in Germany," accessed 18 April 2018. https://www.bundesregierung.de/Content/EN/StatistischeSeiten/Schwerpunkte/Nachhaltigkeit/2016-07-08-fracking-gesetz_en.html

²⁶ IEA 2017 Natural Gas report ... their review of all the methane leakage and fracking reports to date leads to the conclusion that methane is superior to use for coal. Leakage that does exist can

and should be reduced, etc. So, IEA decided in favor of natural gas as a transition fossil fuel. Also, IEA famously predicted the "age of gas several years ago IEA, ".CO2 Emissions from Fuel Combustion 2017 Overview: <https://webstore.iea.org/co2-emissions-from-fuel-combustion-overview-2017>

²⁷ IEA, "Commentary: The environmental case for natural gas," 23 October 2017 <https://www.iea.org/newsroom/news/2017/october/commentary-the-environmental-case-for-natural-gas.html>

frustration in finding any interest in Germany for LNG. Unlike in other EU countries, they said they could see no prospects in the German market. They expressed amazement at the German insistence that LNG is not needed to help displace coal or diesel. The line of argument one finds is that, given the goals of the *Energiewende*, “we will be zero carbon in transport” in a couple decades. This means “expenditures on this infrastructure will be wasted investments” and will only “have to be abandoned when we are all-electric.” Considering the present dismal record in greening transport, including Germany’s stubborn diesel scandal, the hubris of this “technological optimism” appears rather large. However, it is notable that not all environmental or political-party activists reject natural gas or LNG as a bridge fuel in transport.

GroKo’s LNG Support does not aim at Russian Gas Dependency

A much-reprinted media analysis some days after the GroKo document was approved declared: “Merkel Looks to LNG to Cut Germany’s Dependence on Russian Gas” (Bloomberg, 19 March²⁸). The explanation being that “Angela Merkel’s government is seeking to build a liquefied natural gas industry in Germany basically from scratch to reduce the nation’s dependence on supplies arriving by pipeline from Russia and Norway,” and, “Germany is becoming increasingly reliant on Russia for its energy needs at a time when political tensions are mounting with Vladimir Putin’s government in Moscow. That’s prompting Merkel to think again about LNG [...]”

This is unproductive – both vis-à-vis ongoing debates pro and con NS2, as well as for building public support and confidence in the introduction of LNG as a step forward in a lower emissions and commercially competitive maritime and truck transport sectors.

While the gas-import dependency on Russia (and Moscow’s penchant for persistent troublesome behavior)

noted here is de facto accurate, and indeed of concern to many critics of the planned Nord Stream 2, there is no simply no evidence at present to tie this decision to any such GroKo concern. The terminals being approved are of a type and volume-capacity necessarily having a different application, unable to provide any significant reduction in Germany’s massive dependence on Russian, or secondly, Norwegian pipeline supplies.

However, this story was amplified: “Germany’s Pivot from Russian Gas Will Be Costly” (OilPrice.com²⁹) and “Other Than Russia? Germany Reportedly Mulls Finding New Gas Suppliers!³⁰ (Russia, Sputnik).³¹ Der Spiegel too repeated a similar declaration without any supporting quotes or references (5/2016, p. 63). Requests to Bloomberg about the basis for this story were unanswered. An earlier article, on November 27, had made a similar claim: “Plans underway to subdue Russian pipeline gas with German LNG”³².) Notably, an article refuting this interpretation “Is Germany more hawkish on Russia?” appeared. (EuObserver)³³

To be clear, a small-scale facility provides no counterweight to Germany’s Gazprom imports, which will rise from 55 at present to 110 billion cubic meters of gas per year when NS2 is complete, or about 60% of total German gas imports. This would require multiple large-scale LNG regasification terminals capable of fueling a major portion of the country’s electricity generation. While some NS2 critics indeed advocate that Germany build large-scale regasification terminals for such a purpose, what is endorsed is small-scale LNG.

It seems prudent to conclude that although maritime and heavy-transport policy is finally moving in a more positive, environmental and competitive direction in consequence of the recent change in federal LNG policies, the lack of forthright addressing of extensive contrary viewpoints across civil society and engagement as to whether this is a

²⁸Anna Shiryayevskaya and Brian Parkin, Bloomberg, March 19, 2018, <https://www.bloomberg.com/news/articles/2018-03-19/merkel-looks-to-lng-to-cut-germany-s-dependence-on-russian-gas>

²⁹ Oil Price.com, <https://oilprice.com/Energy/Natural-Gas/Germanys-Pivot-From-Russian-Gas-Will-Be-Costly.html>

³⁰ SputnikNews.com <https://sputniknews.com/business/201803201062713797-gas-supply-germany-coalition-russia/>

³² “Plan Underway to Subdue Russian Gas with German LNG Terminal” Nov. 27, 2017.

<https://www.bloomberg.com/news/articles/2017-11-27/plan-underway-to-subdue-russian-gas-with-german-lng-terminal>

³³ 14 April 2018. <https://euobserver.com/foreign/141601>

necessary and beneficial ‘bridging fuel’ by leading officials risks backlashes especially if the new policies stumble in their implementation.

Based on this paper, a short, non-technical opinion article was published at *Berlin Policy Journal* of DGAP. See: [Germany's Real LNG Strategy](#), 28 June 2018.

Low Carbon Cities are not just ‘greener’, they are also more inclusive, have stronger economies and are engines for employment

By Andrew Sudmant and Andy Gouldson

Sustainable, resilient, inclusive, cities, [clean growth](#), and a low carbon economy are a future we collectively aspire to, as outlined by the Sustainable Development Goals, the New Urban Agenda, the blank resilience, and here in the UK, the government’s focus on ‘Grand Challenges’. But if these goals are obvious, our path to achieving them is not. To what extent do we have the technical know-how, the finance, the institutional structures, and, perhaps most importantly, the commitment from politicians, citizens and businesses?

Work by Professor Andy Gouldson, Andrew Sudmant, and the team at the University of Leeds [Can-Do Cities program](#) - an initiative to help cities and communities develop climate and energy strategies – suggests that action can, and indeed should, start and be led by local communities. Using models of urban energy systems and databases of investment costs, the team have developed emissions projections and [action plans](#) for every local authority, local enterprise partnership, region and country in the UK. Results show that accelerating climate action is not just possible, but could provide substantial dividends to local communities.

In Yorkshire, for example, action has the potential to save as much as £3.5 billion each year in energy bills – equivalent to more than £600 per year for every person – and create more than 46,000 years of extra employment. A range of measures could deliver striking savings for individual households (£770 million annually), schools, hospitals, offices and other non-residential buildings (£930 million annually) and industry (£450m annually).

Across the 50 largest cities in the UK £7 billion each year could be saved – that’s equivalent to £300 per year for every person in each of these cities – and more than 90,000 years of extra employment could be created. A range of measures could deliver striking savings for individual households (£2.3 billion annually), schools, hospitals, offices and other non-residential buildings (£1.2 billion annually) and industry (£510m annually).

Andrew Sudmant (@andrewsudmant) is an economist and urban researcher focusing on climate change in cities. Andrew’s [work](#) has a particular focus on understanding how urban accounting methods for carbon emissions affect approaches to action, and on the wider co-benefits of urban climate action. Andrew is a Research Fellow at Leeds University.

Andy Gouldson (@andy_gouldson) is an interdisciplinary social scientist with a background in economics and public policy. Andy has worked on a wide range of issues relating to environmental policy and management since 1990, and has specialized in applied, engaged, impact-oriented research. Andy’s most recent work has been founding the [Leeds Climate Commission](#). Andy is Professor of Environmental Policy and Dean: Interdisciplinary Research at Leeds University.

What’s more, these measures could yield [further social, economic and environmental benefits](#) if they are effectively implemented. For instance, in Leeds, Yorkshire, investments in energy efficiency and retrofits in homes could reduce energy bills more than £80m pounds annually, helping the poorest households to afford to keep warm in the winter.

| Carbon Effectiveness | Total area carbon savings | Measure | Sector |
|----------------------|--------------------------------|---|------------|
| Highly effective | 1 to 5 Mt CO ₂ | Insulation (<i>cost-effective insulation: cavity, loft and floor</i>) | Domestic |
| | | Heating (<i>boilers, heat pumps, controls</i>) | Domestic |
| | | Cooling in retail buildings | Commercial |
| Very effective | 500 to 1000 kt CO ₂ | Boilers and Steam Piping (<i>cost-effective measures</i>) | Industrial |
| | | Demand reduction (<i>minor; heating, lighting and appliances</i>) | Domestic |
| | | Insulation (<i>cost-effective fabric improvements</i>) | Commercial |
| Effective | 10 to 500 kt CO ₂ | Appliances (<i>refrigeration, cookers, TVs, washing machines</i>) | Domestic |
| | | Electric vehicles (<i>cars, goods vehicles and buses</i>) | Transport |
| | | Lighting (<i>low energy</i>) | Domestic |
| | | Pumps (<i>cost-effective measures</i>) | Industrial |

The most effective ways of reducing carbon emissions for the city of Leeds. Andrew Sudmant/University of Leeds, Author provided

| Cost Effectiveness | Total area cost savings | Measure | Sector |
|--------------------|-------------------------|---|------------|
| Highly effective | £250 to £500 million | Cooling in retail buildings | Commercial |
| | | Insulation (<i>cost-effective insulation: cavity, loft and floor</i>) | Domestic |
| | | Hybrid cars (<i>diesel and petrol</i>) | Transport |
| Very effective | £100 to £250 million | Appliances (<i>refrigeration, cookers, TVs, washing machines</i>) | Domestic |
| | | Demand reduction (<i>minor; heating, lighting and appliances</i>) | Domestic |
| | | Heating (<i>boilers, heat pumps, controls</i>) | Domestic |
| Effective | £25 to £100 million | Lighting (<i>low energy</i>) | Domestic |
| | | Pumps (<i>cost-effective measures</i>) | Industrial |
| | | Compressed Air Systems (<i>cost-effective measures</i>) | Industrial |
| | | Fans (<i>cost-effective measures</i>) | Industrial |

The most cost-effective forms of climate action for the city of Leeds. Andrew Sudmant/University of Leeds, Author provided

This work fits into a wider narrative around urban climate action. While it has long been known that climate actions affect more than carbon emissions, and that many actions

yield [economic returns](#), the scope of direct and indirect benefits is only now coming into focus.

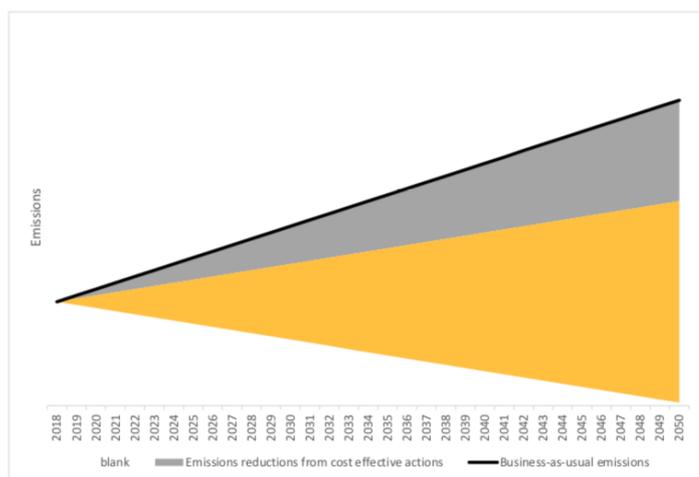


Figure 1: Illustrative impact of valuing the co-benefits of climate action

[Recent research team from the Coalition for Urban Transitions](#) considering more than 700 of the latest pieces of research on the co-benefits of climate action in urban areas reveals the wider benefits of action across global urban areas. Action in cities worldwide can save as much as [24%](#) of urban expenditure on energy over the next decade, generating an immediate increase in GDP of 1-3%, and additional increases in the future as expenditure that previously left cities in the form of energy bills is spend on urban goods and services.

The same actions can also yield substantial benefits for increasing employment. In the building sector alone, Investments in upgrading existing buildings and raising the energy efficiency of new buildings in OECD cities could lead to the creation of two million net jobs annually in the period to 2050. Equivalent investments in non-OECD cities could generate anywhere from 2 million to 16 million jobs annually in the same period.

And these actions can also help to fight inequality and lead to more inclusive cities. Air pollution, noise, and inefficient and incomplete transport networks are challenges of urban living disproportionately faced by the urban poor, recent immigrants, the disabled, and women, and their impact is substantial. Outdoor air pollution causes more than 4 million deaths each year and more than 1 million die in traffic accidents. Actions that reduce fossil fuel use – such as improved household insulation – improve air quality with the largest effects for the most exposed populations, while multi-modal public transport

investments provide the largest benefits to those who do not have cars.

Concerted efforts must to be made to actually realise these benefits. Significant investments are needed. In a typical local authority in the UK, the total cost of low carbon measures across all sectors is about 1% of the [Gross Value Added \(GVA\) each year](#), for the next ten years. Support from national governments is therefore critical.

At the same, climate action must be embedded in the decisions made by local governments, businesses and citizens. Homes and offices are rarely designed with climate change as a primary consideration, and the same goes for transport networks and industrial plants. But the types of buildings and roads constructed today will influence the level of emissions coming from communities far into the future.

The [Leeds Climate Commission](#), an independent organisation created to bring together key local organisations and actors on climate change, provide advice and education, and shape future decision making around climate change, provides one model of how local communities can show leadership. In less than a year since its inception the Commissions has brought together more than 300 businesses, organisations, community members and local government officials and launched a financing initiative to help jumpstart the transition to a low carbon economy.

Analysis from the Can-do Cities team shows that reducing emissions don't undercut social, economic or environmental development; in fact, they contribute towards it. Indeed, climate action can lead to more liveable homes, more productive offices, improved urban mobility, and financial savings for industry: just the sort of improvements which all cities are looking to achieve.

DISCLAIMER

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ANNOUNCEMENTS

EUCERS/KAS Energy Talks 2018

The Arctic Melt: A revival of Cold War tensions between Russia and the US?

11.09.2018, 13-15:00, followed by a reception

River Room ♦ 2nd floor King's Building ♦ King's College London ♦ Strand Campus ♦ WC2R 2LS

The 3rd energy talk in the 2018 series on Climate Change and Security, jointly hosted by Konrad Adenauer Foundation in London and EUCERS, will examine the security implications of opening up the Arctic. We will welcome Dr Rebecca Nadin, Head of the Risk and Resilience programme for the Overseas Development Institute and Dr Petra Dolata, Associate Professor in the Department of History, University of Calgary and Tier II Canada Research Chair to the panel discussion. A full programme will be distributed in the coming weeks.

Over the past decade, the Arctic has experienced some of the most rapid climate changes on earth, almost twice the global average. As the Arctic melts, many stakeholders are talking about the potential to unlock the vast tracts of petroleum not to mention opening up the Arctic seaway to international traffic. However, there is another dimension that needs to be explored: the security implications of opening up the Arctic. Climate change has propelled the region into the centre of geopolitics, as commercial interests clash with environmental and security concerns. At the heart of this debate are two countries that have an economic eye on the region, Russia and the United States. A quarter century after the end of the Cold War that saw both countries trying to outperform each other in a nuclear arms race, Russian-US relations are back in the spotlight due to allegations of foreign influence in the 2016 US presidential election that saw Trump elected, prompting national security concerns and multiple federal inquiries in the US. Among the world's largest emitters and fossil fuels producers, both country's relationship to the UNFCCC process and Paris Agreement has been inconsistent. While the Trump Administration decision to withdraw from the Agreement may have impelled Russia to release statements reaffirming its commitments, they remain the only large emitter yet to ratify the Paris Agreement.

The Arctic melt has several disturbing consequences, notably the changes in the permafrost that covers 25 per cent of the Northern Hemisphere and the release of carbon and methane into the atmosphere. The security threats around retreating ice are twofold: First, long-dormant microbes are being exposed after centuries trapped in the frozen soil and ice, releasing diseases long thought extinct. Second, shrinking ice creates more space to compete over. Trump overturned Obama's 2016 ban on offshore Arctic drilling, while neither sanctions nor the drop in oil prices has deterred state-controlled Russian oil giant Rosneft from developing oil resources in the Arctic. The Arctic melt exacerbates already existing economic, military and environmental challenges to governing the region. This talk will focus on security issues associated with a melting Arctic. What is the probability of another Cold War over the Arctic? What are the unintended outcomes of a retreating permafrost for human security? What is the potential for industry (petroleum, shipping) to aggravate security concerns? How are the economic prospects of opening up the aligned Arctic with environmental and security concerns?

EUCERS ON THE ROAD

| | |
|-----------------------------|--|
| 19.06.2018 Rome, Italy | Frank was a panelist and gave an introductory presentation on “What are the Lessons learnt from Existing Capacity Markets in Europe?” at the EURACTIV/PKEE joint expert workshop “The European Energy Transition: the Role of Capacity Market” |
| 12.06.2018 Madrid, Spain | Frank was a panelist and gave an introductory presentation on “The Commission’s Approved Capacity Mechanisms for Poland and other EU Member States – Implications” at the EURACTIV/PKEE expert workshop “Los desafíos del mercado europeo de la electricidad: la situación española” |

PUBLICATIONS

Umbach, Frank, “Kommerzielles Projekt oder strategische Desorientierung? Die umstrittene Nord Stream-2 Gaspipeline“ („Commercial Project or Strategic Desorientation? The Controversial Nord Stream 2 Gas Pipeline”), Arbeitspapier Sicherheitspolitik, Nr. 19/2018, Bundesakademie für Sicherheitspolitik (BAKS), Berlin, Juli 2018, 5 pp. available online: https://www.baks.bund.de/sites/baks010/files/arbeitspapier_sicherheitspolitik_2018_19.pdf .

— “Uncertain Strategies for Securing Supplies of Critical Raw Materials”, Geopolitical Intelligence Service (GIS), 19 July 2018, 8 pp. available online: <https://www.gisreportsonline.com/uncertain-strategies-for-securing-supplies-of-critical-raw-materials,energy,2597.html>).

— “The Growing Importance of Raw Material Supplies”, Geopolitical Intelligence Service (GIS), (GIS), 19 June 2018, 9 pp. available online: <https://www.gisreportsonline.com/the-growing-importance-of-raw-material-supplies,economy,2582.html>

— “European Energy Market Requires Clear Rules”, BiznesAlert, 19 June 2018 available online: <http://biznesalert.com/umbach-european-energy-market-requires-clear-rules/>

— “China’s Belt and Road Initiative and the Mediterranean Region: The Energy Dimension”. KAS-Mediterranean Dialogue Series, No. 14, June 2018, 12 pp. available online: http://www.kas.de/wf/doc/kas_52761-1522-2-30.pdf?180608114654 .

IN THE MEDIA

Our Research Director, Frank Umbach, was interviewed by Maria Bonucci of EurActiv: 'Italy and Poland's Electricity Markets Face Uncertain Future', Euractiv, 9 July 2018 (<https://www.euractiv.com/section/electricity/news/italy-and-polands-capacity-markets-face-uncertain-future/>)

SOCIAL MEDIA



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