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It Was 25 Years Ago...

Editor's note by Wytze van der Gaast

March 1995. Berlin. Negotiators gathered for the first Conference of the Parties, COP1. About a year after the UN Framework Convention on Climate Change (UNFCCC) had entered into force. COP1 was a milestone in many ways. Countries had been urged by scientific insights (assessed by IPCC for the second time) to go beyond the goal of stabilising emissions, as had been the main climate goal thus far. The COP needed to initiate negotiations on a protocol with emission reduction actions. With hindsight, COP1 was also historical as it was chaired by a young German Minister of Environment. At that time, only Germany knew Angela Merkel.

For us at JIN, COP1 was a milestone as it was the first time that we published the Joint Implementation Quarterly (JIQ), the zero-issue of Volume 1. With sponsorship from the Netherlands Government, JIQ's goal was to inform people about Joint Implementation (JI), a new concept that had been landed in the UNFCCC as a co-operation mechanism for countries to invest in emission reduction projects abroad and get carbon credits in return. JI had a rough start as it was considered by many as an opportunity for industrialised countries to postpone domestic actions and do, instead, relatively cheap projects abroad, preferably in developing countries. Some observers even used the term 'eco colonialism' to underline their concerns about this new concept.

The Netherlands Government, with several other countries, believed in JI as a way to collaborate on emission reduction efforts in cost-effective ways and facilitate climate technology transfer to host countries. This enthusiasm was met by countries such as Costa Rica that saw the potential of JI to support its ambition of becoming climate neutral. It was also the time that information exchange did not take place via the Internet, but mainly through conferences and newsletters. JIQ was thus initiated to be an information platform with concrete policy initiatives on JI, projects demonstrating how JI projects would work and discussions among JI stakeholders.

When Angela Merkel gavelled the COP1 decision, it was clear that JI had survived in the negotiation text, albeit with a different name, Activities Implemented Jointly or AIJ. Whether this was because of the 2000 copies of JIQ that we brought to Berlin, we don't know, but we could see negotiators reading the magazine in the negotiation room and in the corridors. After 'Kyoto' in 1997, AIJ became JI again and was further developed as the Clean Development Mechanism (CDM, focussing on projects in developing countries). For JIQ, the work on JI and CDM as

the Kyoto mechanisms, was a very interesting phase, with lots of intellectually challenging discussions of accounting issues, such as baseline methodologies, determination of additionality, crediting, embedding projects in development contexts, etc.

After the entry into force of the Kyoto protocol in 2005, the Netherlands' government stopped sponsoring JIQ. The work was done. Task accomplished. At JIN, we continued JIQ as an online portal with reports of our projects for the European Commission, the UN bodies or national assignments. Nowadays, however, with a vast and quick information exchange taking place via the internet and social media, we feel that JIQ's task has been truly accomplished, also for us.

We look back at 25 years of JIQ with great satisfaction and pride, and are grateful to the policy

makers at the Netherlands Government back in 1995 who trusted us to do this task: Henk Merkus, Wim Iestra, Bert Metz and Maurits Blanson Henkemans. We thank our readers for their collaboration over the years, interest in our work, discussions and appreciation. It has been a pleasure.

JIN of course continues with a portfolio of exiting projects, and we will continue to provide updates via our website www.JIN.ngo, our Twitter [@JIN_Climate](https://twitter.com/JIN_Climate), and [LinkedIn](https://www.linkedin.com/company/jin-ngo). In this final JIQ issue you may find a few more interesting articles on lessons from 25 years of policy making, sustainability in health care real estate, and Technology Needs Assessments, as well as a short overview of 25 years JIN and JIQ (pages 7 to 9).

We would like to conclude by wishing you all the best for the New Year.

25 Years Climate Policy: Time Flies

By **Catrinus J. Jepma***

As Wytze explained in the Editor's Note, the JIQ was originally set up to provide information on and create understanding for the upcoming trading mechanisms that in those days were foreseen to be part of the new international climate policy regime. Actually, the concept as I recall was strongly promoted in those days by the Americans based on the notion that it doesn't matter where mitigation is organised, so why not start with the most cost-effective options anywhere in the world, because then overall costs will be lowest and chances of political acceptance highest. Although this concept was basically fairly simple and seemingly easy to understand, there yet was a serious mistrust against the notion of trading. Probably the largest fear in those days was that it would make mitigation policies too easy and therefore would fail to create sufficient awareness with the public at large about the urgency of the climate issue.

Now, we are 25 years later. We passed Kyoto and are heading for a serious start of the Paris Agreement.

The odd thing is that one of the reasons why COP25 of this month in Madrid was disappointing exactly because no agreement could be established on how to deal with the 'leftover' Kyoto credits into the future.

So, what lessons can be drawn from the last 25 years of international climate policy making?

A probably first lesson is that policies and measures and international coordination of those is indeed at the heart of the solution. Of course, technological developments and awareness are essential for dealing with the climate challenge, but without serious and accepted policies and measures and without decisive international collaboration, reaching climate targets will be illusory. So, there is really a huge need for political leadership, active diplomacy, and a serious and consistent set of policies and measures at all levels that makes sure that awareness and technological change actually work.

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Obviously, many mistakes have been made in climate policy making, but it is most important whether one has learned from that, so that mistakes are not repeated. This gets me to the second lesson. This is that the nexus between effective climate policy and the need for dealing with development priorities of developing countries has been underestimated right from the start. It was a real struggle to create worldwide engagement in dealing with climate issues as long as countries and their citizens had the feeling that a huge problem had been created by others, that most of the damages accrued to them, and that there were still so many other legitimate priorities deserving attention first. In the Paris Agreement a multi-billion Adaptation Fund is foreseen, which hopefully will be filled with tens of billions of euros per annum by the industrialised world, but such a fund should have been set up much earlier to show the developing world that the industrialised world is seriously prepared to help dealing with damages and suffering.

A third lesson is that climate policy is a struggle, because of the natural tendency of countries trying to free-ride. There can be many reasons why free-riding is an attractive strategy: there may be some specific national fossil sectors to protect, the economic performance can be disappointing, the argument of losing competitiveness can be used to withdraw from the reasonable responsibilities, or one tries simply to maintain income from fossil production as long as possible. There is no easy solution to deal with this tendency to slow down real political progress by pointing to others to solve the issue. So far, most of the hopes have been on international diplomacy to get to acceptable deals by persistence, or to persuade countries to enter into voluntary deals that they can suggest themselves (which is typically the approach taken through the Nationally Determined Contributions in the Paris Agreement). One may wonder – given how the climate issue seems to accelerate – if we do not need a system with somewhat more ‘pepper and salt’. So far, real instruments to tackle aggressive free-riding strategies – such as, for instance, trade policy measures by introducing import taxes on greenhouse gas polluting products and services have not been introduced because of fear of escalation. One can, however, wonder why the increasing protectionist practices of the last years for questionable reasons would be acceptable, while at the same time similar actions for the sake of the climate would be a priori ruled out. If, for instance, a country would seriously withdraw itself from legitimate mitigation commitments, why would it then be able to gain a competitive edge vis-à-vis other

countries that would intensively tax their industries to get greener?

A fourth lesson is that policy makers have to learn from their mistakes and therefore avoid repeating them. An example relates to European climate policies – that now actually appear to intensify given the plans of the new European Commission.

A first mistake made in EU policies so far has been a consistent bias towards greening the electrons, while almost forgetting the energy molecules. The result is that the about a quarter of the energy system, i.e. the electric part, in final uptake is doing well in greening (currently about a third), while the three-quarters consisting of molecules is still almost as grey as it was 25 years ago (just a few percent green only). The result of this myopic policy is that in the next thirty years, one has to do whatever it takes to green the molecules, if the 2050 targets are to be reached.

A second mistake has been that policy interaction had been completely overlooked. There is clear evidence that the very substantial renewables and energy efficiency subsidies (about a trillion euros) backfired on the EU's Emissions Trading System by undermining the scarcity on the allowance market and keeping allowance prices low for a long time. Incentives for the industry to green therefore have become low and unclear, which may have slowed down climate policy progress. This also puts pressure on what still needs to be done during the next decades.

A third mistake has been to completely rule out specific technologies, even if their mitigation impact is clear. Examples are non-acceptance of CCS, fast dismantling of nuclear energy, or serious admixing of hydrogen into the natural gas grid.

But again, mistakes are an indispensable part of policy making that put an additional burden on next generations of policy makers, but what matters is that one learns from them and acts accordingly.

This leaves us with the important role of those that critically assess climate policy making, try to understand how it works but also how it comes about, look at the role of stakeholders and engagement, and follow the international diplomacy. They have an important role to play in keeping the policy making system ‘fresh’ and ‘sharp’. Although the JIQ has only been a very small component in this process, we have done our best and are confident that our role will be filled by others.

Five Challenges to Greening Real Estate in the Dutch Health Care Sector

By Eise Spijker*

On the 21st of November, the RES4BUILD research and innovation project hosted its first stakeholder workshop in the village of Vries, the Netherlands. The workshop was co-organised by RES4BUILD partner JIN Climate and Sustainability and Royal Visio. The workshop was the official kick-off of the collaboration between RES4BUILD and Visio that will run until the end of 2023.

Royal Visio provides health care and education to clients with complex disabilities, and is specialised in treating clients with visual impairments. Within the framework of RES4BUILD, Royal Visio and JIN have teamed up in an effort to:


- provide the technology and innovation partners in RES4BUILD with feedback from the end-user/buyers' perspective on the feasibility of implementing (novel designs for) integrated energy solutions in the built environment; and
- support Royal Visio in their efforts to develop a robust strategic and operational roadmap for greening their real estate portfolio.

The workshop participants were invited for a lunch and a short guided tour on the Visio site in Vries. Mr. Frits Colenbrander - Manager Daycare at Visio and co-host of the workshop gave a short welcome address to the participants.

Five challenges

The workshop was framed around five key challenges that Royal Visio faces in the process to decarbonise their real estate portfolio.

Challenge **1** targets the question which combination of renewable energy and other technologies will be most suitable. Challenge **2** focuses on the issue of the quality and availability of data on the buildings (e.g. degree of insulation, glass type) and their energy consumption. Challenge **3** covers the financial matters of securing the initial investments, and covering operational expenses within the boundary conditions given by the Dutch health care system. This system,



Co-funded by the European Union

RES4BUILD contributes to the decarbonisation of the energy consumption in buildings by developing integrated renewable energy-based solutions that are tailored to the needs and requirements of users and installers.

Key objectives of RES4BUILD include: (1) to improve the performance and reduce the cost of innovative RES technologies, like heat pumps and PV-T panels; (2) to develop tools for optimal control and use of integrated RES systems; (3) to engage relevant stakeholders in an interactive process to co-design integrated energy systems that suit current needs and future expectations; and (4) to test different novel RES systems in different climates in the EU.

For more information, see: www.res4build.eu.

which is primarily designed to ensure adequate care is provided to those in need, also covers funding for housing of clients through the so-called normative housing component (i.e. a certain share of the compensation can be used to provide housing to clients). Challenge **4** is highly relevant to long-term care institutes like Visio, where the needs and requirements of the residing clients as well as staff need to be factored in. These requirements can affect the speed at which a contractor can perform its work, for example when refurbishing the houses in which the clients live on site. Challenge **5** is all about the way in which Royal Visio organises itself internally (e.g. allocation of tasks and responsibilities between relevant staff) as well as externally, in terms of engaging in contracts and partnerships with for example the local public authorities and contracted suppliers including construction companies.

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Greening Visio

Several speakers were invited to target the challenges. After the presentations, the workshop participants were invited to discuss their ideas and suggestions that could help Royal Visio to overcome the five challenges. The results of these break-out sessions will be used as input for the next steps in the collaboration between RES4BUILD and Royal Visio.

Royal Visio's housing manager **Daan Bollinger** set the scene of the afternoon and provided some basic information about the real estate portfolio, their greening strategy, and expected issues. With 300+ smaller and larger locations, 125,000 m² of building space, and an estimated asset value of EUR 57 mln., Royal Visio has a sizable and diverse real estate portfolio. The site in Vries (see Figure 2), is one of the larger Visio locations representing roughly 25% of total gas and electricity consumption of the entire organisation. With over 60 buildings and (currently) only a handful of energy meters for that site, there is a clear need to enhance the quality of both the building and the energy consumption data.

John Burgess, Associate Director at project partner ARUP, continued the pitch presentation sessions by providing some initial insights into the technical feasibility of different renewable energy and energy saving options for the Vries site. This preliminary scan was based on data available in the public domain, and showed that there is adequate potential for generating renewable electricity on or near site. For

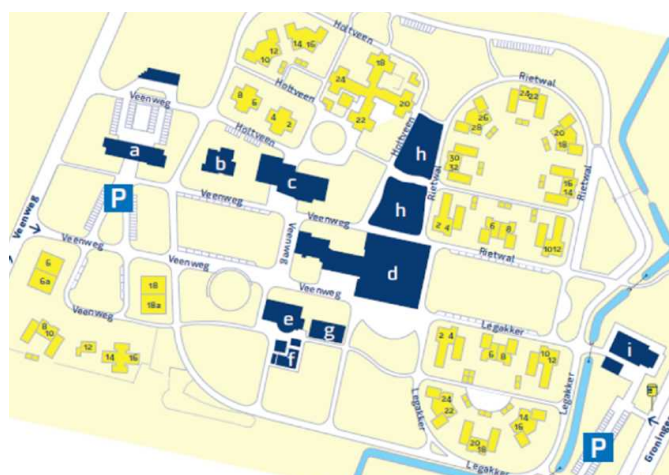


Figure 2. Map of the Vries site of Royal Visio.



Figure 1. Workshop attendees discuss finance options (challenge 3) at the meeting in Vries, the Netherlands.

alternative heat supply sources the situation appears to be more challenging. With almost no large industries with excess heat located nearby, a local heat grid will be difficult. Also vertical geothermal systems are not allowed within the current regulatory framework in the Vries region. Other options, like solar thermal, solar thermal-electric, horizontal (closed) geothermal systems, and air heat pumps were labelled as a feasible alternative for natural gas based heating systems.¹

With Visio being labelled as an industrial user of electricity from the grid, the average kWh price that is being paid is relatively low. As a result of this low price, there are very few investments in reducing the organisation's energy consumption and CO₂ emissions that have a favourable payback period. This shows that smart and perhaps also novel financing mechanisms are needed to trigger the right kind of investments made by health care providers like Royal Visio. Finance expert **Joost Schretlen** from SEGON provided a presentation on novel financing schemes that are currently being developed or utilised in the built environment. Some of the novel financing schemes or business models discussed include:

- Design-Build-Finance-Maintain-Operate (chain integrated)
- Total Costs of Ownership finance on energy and maintenance savings
- Building related finance models
- ESCO financing
- Performance-related long term contracts

¹ The current Dutch policy is targeting a full phase-out of the use of natural gas in space heating in the built environment. This is partly driven by the national climate strategy, aiming to reduce GHG emissions, but also driven by the earthquakes in the Northern part of the Netherlands that have manifested as a result of onshore gas exploration and production from the large onshore Groningen gas field.

With the current low interest rates and the considerable rise in real estate prices, the prospects for attracting adequate funding for investments in renewable energy and real estate renovations look promising. However, given the size of Visio's real estate portfolio the required investments to become energy or climate neutral will be considerable. With such an investment challenge there is a real risk of crowding out other needed investments in their core business (i.e. investments in health care and education to the visually impaired).

Karim El-Guallai, an engineer and real estate manager from BAM Facility Management, continued the workshop and provided an overview of innovative building insulation concepts, materials, and services agreements. BAM FM is the current contracted party for providing building and construction services to Visio. Karim El-Guallai highlighted that BAM FM offers different contract forms varying from a role as traditional contractor up to the level of a full service provider, e.g. through an ESCO contract. The type of contract / agreement sets the conditions for BAM FM to collaborate with clients like Royal Visio, to achieve the different sustainability goals. Here it will be clear that the more traditional contract forms, provide much less certainty that energy/climate neutral or circular building and renovation concepts will be applied, but that more novel contract forms to achieve more ambitious goals also come at a certain price.

The presentation by BAM FM is a clear reminder that the type and nature of all contracts/agreements that health care organisations have with external stakeholders (e.g. consultants, service providers, public authorities, the neighbourhood) are vital to achieving energy and climate targets. If one or a few of this portfolio of agreements / contracts with external stakeholders is not 'fit for purpose' (i.e. does not enable effective collaborations), it could frustrate the efficient achievement of such targets.

Ugo Leever, project coordinator Expedition Energy Neutral Housing from the province of Drenthe, illustrated the role of the province and municipalities in supporting society in the energy transition process in the built environment. Ugo mentioned that the energy transition is first and foremost a process that is driven by people and collaboration. He stressed the importance of a 'neighbourhood-oriented approach' towards greening the building stock. Such an approach can help in making the right (investment) choices, and minimise any social acceptance issues regarding new technologies. The approach requires

participation of relevant stakeholders living and working in the same neighbourhood, and is an important element within the national heat transition policy. This policy considers the phase-out of natural gas for space heating in, and decarbonisation of the built environment within the Netherlands by 2050. By the end of 2021 all Dutch municipalities are required to submit their transition vision heat plans. These plans should address the question of what alternative heating systems will be deployed in a given neighbourhood. Will the neighbourhood go all-electric? Will there be a district heating system? Or will renewable gases be used for heating?

The above suggests that the greening ambitions of Visio are not isolated or immune from the ambitions and developments in the specific region. With a significant presence in many neighbourhoods, the heat plans will also have an impact on planning and designing the greening ambitions of Visio. These ongoing 'external' processes also put a demand on Visio to engage and liaise with local stakeholders, like local residents, the municipality and province to remain synergetic and effective. There is a lot of evidence suggesting that a collective and participatory approach offers a range of social and economic benefits. But at the same time these multi-stakeholder processes require ongoing commitment and are not easy to maintain. With the list of interactions with relevant external stakeholders gradually increasing, it is evident that also internal organisation of health care organisations might need to be revised (e.g. is there enough capacity / staff to run this process?).

Next steps

The stakeholder workshop has shown that the five challenges that health care organisations face are a bit like "juggling with five balls". All five challenges need to be addressed in parallel, using a sound planning or roadmap strategy. In the coming years, the RES4BUILD project will provide support to Royal Visio by:

- Helping with the development of a roadmap for greening the real estate portfolio
- Collecting and providing relevant evidence on good practices
- Enabling engagement with stakeholders (e.g. municipality, province, ministry)
- Provide information and data support on feasibility renewable energy technologies and finance options
- Ensuring to obtain the latest insights and knowledge from relevant policy and industry networks

25 Years of JIN Climate and Sustainability and JIQ Magazine #JIQ25

How JIN and the JIQ began

After the concept of Joint Implementation (JI) was included in the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, a conference on JI was organised in Groningen, in the Netherlands, on 1-3 June 1994. The conference concluded with the **Groningen Statement on Joint Implementation**, which recommended "to explore the possibilities of efficient ways to sustain the process started by the Conference, such as a JI newsletter and a network for the exchange of information on JI studies and projects." This network became Joint Implementation Network (JIN) and the newsletter is known as the Joint Implementation Quarterly (JIQ), initially commissioned by the Netherlands' government.

The first prototype issue of the JIQ was published in Spring 1995 and distributed with a circulation of 1,500 at the Conference of the Parties on its first session, i.e. COP1 in Berlin. Since then, 25 volumes of the JIQ have been prepared and distributed free of charge. Initially the circulation was by regular mail to (on average) 2,000 subscribers in 130 countries. Since the 2000s the distribution of the JIQ has increasingly taken place online, with since 2005 no physical issues being printed anymore.

Joint Implementation projects

In its early years, the JIQ was the chief discussion forum for issues related to JI, and later the Kyoto Mechanisms in general, with countless updates, discussions, and letters to the editors on issues such as crediting, trading, and additionality. Each JIQ issue described the latest JI projects and included a list and map of planned and ongoing JI (pilot) projects.

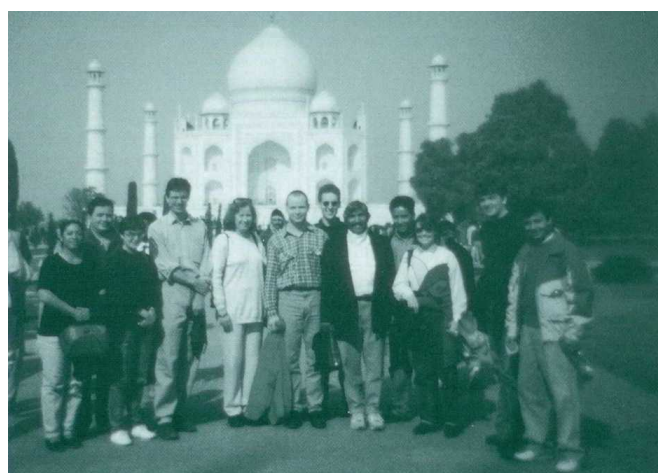
Planned and ongoing JI (pilot) projects



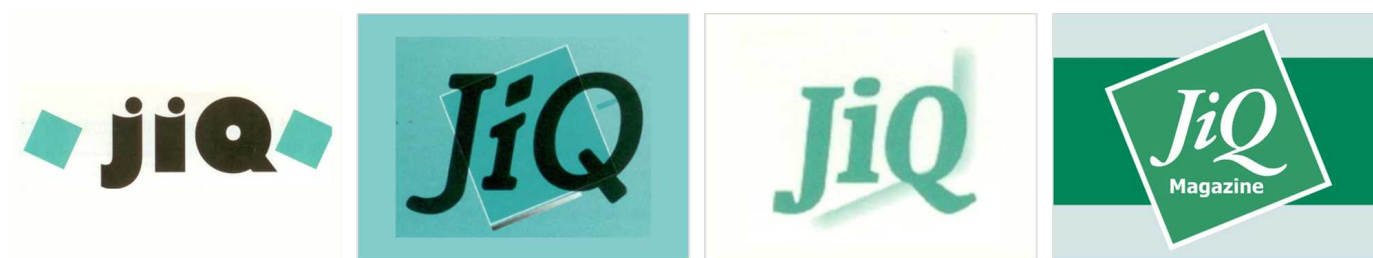
Map of JI projects in JIQ vol. 2, no. 2 (July 1996).



The first regular JIQ issue: vol. 1, no. 1 (Summer 1995).



In addition to the publication of the JIQ, JIN actively supported networking related to JI and the Kyoto Mechanisms, such as through the organisation of a conference in New Delhi in 1997. Conference attendees had the chance to visit the Taj Mahal.



Evolution of the logo of the Joint Implementation Quarterly (JIQ Magazine) from 1994 to 2019.

Visit JIQ's homepage
<http://www.northsea.nl/jiq>

In March 1995, at CoP1 in Berlin the Joint Implementation Network, the Netherlands, presented the first issue of the JIQ. Since then eight issues have been published which are now available on the internet.

At <http://www.northsea.nl/jiq> the various JIQ articles can be found under the following headings:
 Editor's Note
 Country Programs
 Interviews
 Project Descriptions
 Conferences
 Background Info
 Literature

In addition, the JIQ homepage will serve as a platform for discussion to which new ideas, suggestions, discussion topics, and information on projects, country programs, AIJ/JI studies, etc. can be delivered and made available to other JIQ homepage readers. As is the case with JIQ, the success of the JIQ homepage will therefore strongly depend on the degree to which it reflects the spirit of AIJ/JI.

Please note that JIQ's email address has changed into: jiq@northsea.nl

Advertisement for the JIQ's first website (1997). JIQ issues are now available via JIN's website at www.jin.ngo.



Workshop on Joint Implementation organised by JIN in Callantsoog, the Netherlands (1998).

Broadening scope of JIN

Being initially commissioned by the Netherlands' government for a network and magazine on JI, from 2000 the scope of JIN broadened to all Kyoto Mechanisms and climate policy in general. In 2001, JIN started its first EU-funded project, as coordinator of the PROBASE research project on developing operational procedures for JI/CDM baseline determination and accounting. For JIN, PROBASE was the beginning of a series of European projects under the FP5, FP6, FP7, Intelligent Energy Europe, and Horizon 2020 research frameworks. Starting from projects relevant to the Kyoto Mechanisms including

PROBASE (2001-2002), SYNERGY (2003-2005) on CDM projects in the Mediterranean, and ENTTRANS (2006-2007) on CDM potentials, more recently the scope of JIN's European projects has broadened to general climate policy and policy interrelationships (APRAISE, POLIMP, CARISMA, TRANSrisk), bio-energy (BIOTEAM), the green economy (GreenEcoNet), energy efficiency (ENSPOL, PUBLNEF, EU-MERCI), and energy use in buildings (RES4BUILD). For 2020, JIN is in the process of preparing Grant Agreements for two Horizon 2020 projects, LANDMARC (land-use based mitigation) and WaterMining (smart water management systems in the circular economy).



Climate and development

The broadening scope of JIN is also clear from the increasing activities at the intersection of climate and development, such as the work on the Technology Needs Assessment framework in developing countries. In 2009, JIN was co-author of the updated 'Handbook for Conducting Technology Needs Assessment for Climate Change', and since JIN has been involved in the drafting of numerous papers on TNA syntheses, good practices, lessons learned, and recommendations. In 2011-2012, JIN was also a consultant for the TNA implementation in Montenegro.

Green Deal National Carbon Certificates

An issue that was first discussed in the JIQ in 2007 (vol. 13, no. 1) and that is still relevant is that of a domestic carbon market (in the non-ETS sectors). Today, the Green Deal National Carbon Certificates is a Dutch initiative to support voluntary emission reductions in the Netherlands, in areas not yet covered by policy instruments. Through the initiative projects can receive additional revenues by valuing their realised emission reductions. The certificates issued by the Green Deal secure that the emission reductions are additional and real. Potential buyers of certificates are individuals or organisations in the Netherlands that voluntarily invest in Dutch climate projects, or, sometimes preferably, region. The first certificates are expected to be issued early 2020.



Over the years, JIN has held offices at four different locations in and around Groningen. It started at the Groningen University Campus "Zernike", followed by offices in the suburb of Paterswolde and at the Energy Business Plaza. Since 2017, JIN has its premises in the "Schnitgerhuys", an 1883 townhouse and national monument in Groningen's city centre.



The TNA Handbook, co-authored by JIN

JIN staff and JIQ editors

JIN was founded by Prof. Catrinus J. Jepma in 1994. From the beginning, the then newly graduated Wytze van der Gaast was part of the team. For all of the last 25 years, Catrinus and Wytze have formed the heart of JIN and of the JIQ's editors team. Over the years, the following persons have joined JIN:

- Catrinus J. Jepma (1994-2019)
- Wytze van der Gaast (1994-2019)
- Martin Ossewaarde (1994-2004)
- Maarten-Jan Eisma (1997-1999)
- Jan Bandsma (1999-2003)
- Michiel ten Hoopen (2000-2002)
- Martijn Broekhof (2002-2004)
- Eise Spijker (2005-2019)
- Friso de Jong (2005-2007)
- Anna van der Gaast-Witkowska (2007-2016)
- Vlasia Oikonomou (2009-2018)
- Job Taminiau (2009-2010)
- Erwin Hofman (2013-2019)
- Krisztina Szendrei (2013-2017)

Keep in touch

While after 25 years this is the final regular issue of the JIQ, JIN will continue its work. Updates on our projects and publications will be shared via the website www.JIN.ngo and via social media such as Twitter, [@JIN_Climate](https://twitter.com/JIN_Climate).

Digital issues of the JIQ starting from volume 13 (2007) are available for download at the JIN website. If you are interested in earlier JIQ issues, feel free to contact us at jn@jin.ngo.

Climate and Development Planning in Developing Countries: A Continuing Role for TNA

By Erwin Hofman and Wytze van der Gaast*

President of COP25 and Chile's environment minister Carolina Schmidt has a clear message: "Climate action and economic development do not move along separate tracks; on the contrary, it implies that the way to achieve a real sustainable development is the protection of the environment; in order to achieve this, adaptation and mitigation to climate change are essential." A related remark came from Gonzalo Muñoz Abogabir, Chile's high-level climate action champion, who emphasised that "small countries can make a difference" in leading by example on changing the way the country acts.

A key instrument for country-driven climate action in line with the global climate targets as well as local development needs is the Nationally Determined Contribution (NDC). Pablo Vieira, global director of the NDC Partnership Support Unit: "We have learned that for successful implementation of NDCs, it is fundamental to have high-quality information, as well as realistic and implementable actions, to have broad support from society and across government." It is increasingly recognised that increased ambition for NDCs can be realised by establishing links with the process of Technology Needs Assessments (TNA), as the bottom-up prioritisation and planning process for both climate and development of a TNA can complement the often top-down assessments of climate goals of an NDC.

This was endorsed by a side-event on the linkages between TNAs and NDCs at the UN Climate Change Conference in Bonn in June 2019, where it was noted that NDCs are at the heart of the Paris Agreement (i.e. top-down commitment), while TNAs provide an opportunity to communicate mitigation and adaptation technology needs, in line with development goals and with a view of implementation (i.e. bottom-up conception). This article briefly discusses the experiences with TNA, and the utility of the TNA process for the preparation and implementation of NDCs.

Experiences with TNA

A TNA is a country-driven, participatory process with the aim to identify, prioritise and implement technologies that reduce greenhouse gas emissions (mitigation) or decrease the vulnerability to the effects of climate change (adaptation). In the TNA, technologies are prioritised in light of a country's development priorities in sectors where the strongest combined development and climate benefits can be achieved. The process consists of a prioritisation of sectors and technologies, an analysis of barriers that may be faced by these technologies, and the development of technology action plans (TAPs).

Developing countries around the world have experience with carrying out TNAs since the need for the assessment of country-specific technology needs was stated in The Marrakesh Accords in 2001. A decision by COP13 in Bali (2007) further reiterated the importance of TNAs and the need for funding for a Global TNA Project, which subsequently started in 2009. Based on the TNA Handbook published in 2010 and a range of guidance documents, many developing countries have developed detailed and high-quality TNAs. Since the start of the Global TNA Project, TNAs have been implemented in 36 countries in Phase I (2009-2013) and 26 countries in Phase II (2014-2018). Currently, since 2018, Phase III is ongoing in 23 countries. For this phase, and also for the upcoming Phase IV, the focus is specifically on LDCs and SIDS. In 2019, the TNA Handbook has been replaced by a new 'TNA Step by Step' guidebook.

The 2015 TNA good practices paper concluded that TNAs are successfully carried out in many countries. Identified good practices include the active involvement of key ministries responsible for national development planning; a participatory process so that stakeholder preferences are taken into account; and the use of multi-criteria decision analysis (MCDA). While the TNA processes therefore usually led to a well-developed prioritisation, it was also

* Erwin Hofman and Wytze van der Gaast (wytze@jin.ngo) are researchers at JIN Climate and Sustainability, Groningen, the Netherlands. This article is based on the 2019 TNA Good Practices paper as prepared by the authors in collaboration with the UNFCCC secretariat for the Technology Executive Committee.

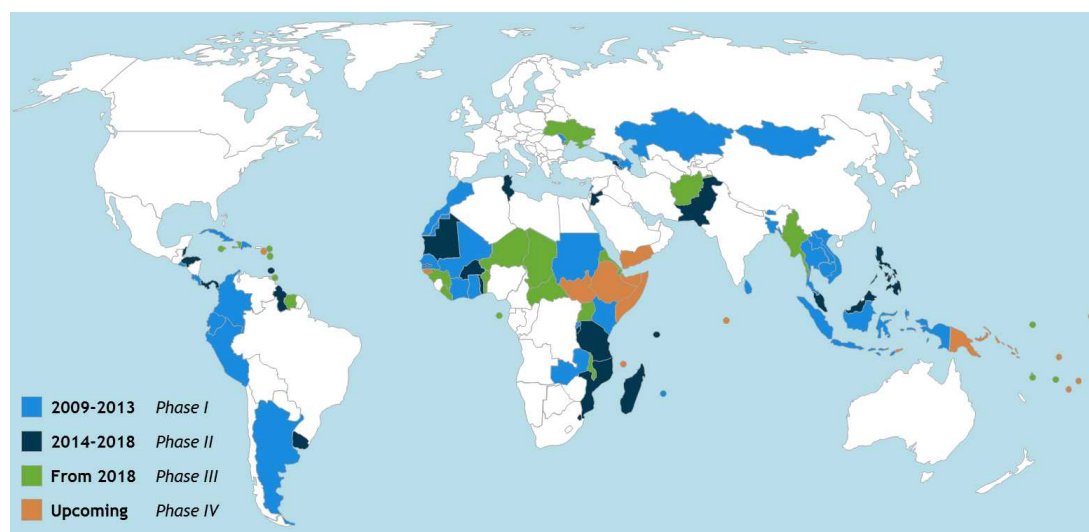


Figure 3. World map showing countries that have carried out or plan to carry out a TNA.

acknowledged that it remains a challenge to go from TNA results and TAPs to funding and implementation, and that most TAPs contained insufficient information to be considered for finance and investment.

Good practices and remaining challenges

In September 2019, a new TNA good practices paper has been presented to the Technology Executive Committee (TEC), the policy arm of the UNFCCC's Technology Mechanism. While the previous 2015 paper mainly focused on the improvement of the TNA process, this new paper specifically aims at ways of ensuring that TNA results will be actually implemented, following on the challenges recognised in the 2015 paper.

Updated TAP guidance in recent years has significantly improved the quality of the TAP reports, with clear and consistent information on for example stakeholder roles and responsibilities, timelines, budgets, and potential funding sources. Many of the countries in Phase II have followed the new guidance meticulously, and the TAPs are seen by stakeholders as useful documents to get TNA results towards implementation. However, it was concluded that well-structured TNA processes and complete and detailed TAPs do not necessarily lead to implementation. Therefore, the new paper has identified key factors for successful implementation, not only during the TNA development itself but also in the process that follows, i.e. in the 'post-TNA phase'.

As shown by the examples in Box 1, the TNA process can already lead to successful implementation. However, several challenges remain.

A TNA process is an opportunity for in-country **capacity building** among for example government

staff. In order to ensure high-quality TNA and TAP reports, however, there is often a reliance on external consultants. Therefore, while consulting experts during the TNA-TAP process generally strengthens the process strongly, governments should avoid becoming 'empty-handed' once the TNA is done and the consultant gone.

Related to that is the issue of **which ministry** will be responsible for implementation of the TAP. While the TNA process itself is often led by a Ministry of Environment, it is emphasised that it is important to make relevant key ministries (e.g. Ministry of Economic Affairs and Ministry of Agriculture) (co-)responsible for implementation of TNA results. In order to enable this, there needs to be strong coordination of the process resulting in clarity on the 'ownership' of TNA results and action plans, so that it is clear who will be responsible for implementation in the post-TNA phase.

In this framework, the role of '**champions**' has often been mentioned by TNA practitioners. These (technology) champions are people who have a task or a clear incentive or motivation to advance a technology to implementation. By discussing the 'ownership' of TAPs from an early stage, technology 'champions' could be also identified and/or appointed upfront. In various countries it was experienced that oftentimes the 'champions' are medium-level planners at the ministries, as these usually have more in-depth technical knowledge and relevant contacts, and are less susceptible to political versatility than high-level policy-makers and politicians.

It may be difficult to **mobilise finance** for the TNA results. One reason for this may be that there is a mismatch between the priorities as selected in the

Box 1. Examples of successful TAP implementation

'Champions' of Lebanon's transport sector

In 2018, in the Lebanese transport sector a tax incentive was introduced for hybrid and electric vehicles, providing financial support to technologies prioritised in the country's TNA. An important stimulus for this development has been the lobbying by an 'informal transport group' which emerged as a stakeholder group during the TNA process. It continued to collaborate beyond the TNA, including through co-organising the first e-motor show in the Middle East and the e-mobility conference in Lebanon.

This case shows how combining different private and policy perspectives has helped to move a technology option forward beyond a TNA. For example, while car owners are interested in electric or hybrid vehicles for the fuel saving perspective, for the Ministry of Energy the main benefit of scaling up e-mobility is that it leads to lower energy demand from transportation. Bringing these perspectives together requires awareness raising and lobbying which the informal stakeholder group was able to do, with the specific outputs from the TNA in their baggage.

Private initiative in Mongolia

An example of how through the initiative of a private bank TNA-prioritised technology options have been supported for implementation can be found in Mongolia. XacBank used the TNA results to develop a loan programme for purchasers of energy efficiency and renewable energy equipment. In order to keep interest rates relatively low, XacBank successfully applied, as the first private sector entity from a developing country, for funding (USD 20 million) from the GCF.

TNA and the preferences of international donors. A specific recommendation in this framework is to engage potential funders from an early stage in the TNA process, so that stakeholders are informed about the relevant funding sources and so that the funders can guide the process. It is also an option to organise a 'donor conference' as a final step of the TNA process, with involvement of in-country funders but also for example the Green Climate Fund (GCF).

Many climate policies, such as NDCs, are ongoing or recurrent processes. TNAs on the other hand are set up as one-time projects, with the risk that the results

are no longer considered and pursued once a TNA has been completed. It is therefore recommended to have TNAs fully **embedded in ongoing policy processes** or institutional structures, which may be national policies but also international processes such as NDCs. It has been suggested to ensure the co-development of TNAs with NDCs, NAMAs, and international funding pipelines such as for GCF, GEF, and the Adaptation Fund. This helps to avoid 're-inventing the wheel' and increases chances of TNA results' implementation.


Until recently, learning from TNA implementation results has been hampered by the absence of a **monitoring and evaluation** system. The latest TAP guidance therefore includes a step for tracking the implementation of TNA results in the post-TNA phase. It has therefore been suggested to potentially include monitoring of TNA result implementation under the monitoring actions of the Paris Agreement. This will allow for cross-learning, trust building, and streamlining future TNA processes.


It must be noted that **success factors may differ per country** (based on e.g. local context and country size) so that caution is needed regarding generalisation of the lessons mentioned above. Under the Global TNA Project dozens of countries have completed TNAs or are currently working on it, which leads to enormous opportunities for cross-learning. The available TNA guidance documents allow developing countries to carry out TNA processes based on state-of-the-art methodologies and years of experiences. Nevertheless, the TNA organisation and financiers should be aware of the possible need to diverge from the guidance because of local circumstances and requirements.

Looking forward


In line with the recommendations in the good practices paper, the TEC's rolling workplan for the years 2019-2022 also indicates the importance of "activities aimed to help countries in enhancing the implementation of technology actions identified under TNA process", including continued work on the linkages between TNA and NDC processes. It is generally acknowledged that the TNA process can continue to play a key role in the climate and development planning for developing countries, with the bottom-up prioritisation and planning process of a TNA complementing the often top-down assessments of an NDC. As one TNA practitioner mentioned: "TNA and NDC are wagons of the same train, so that we should regard them as interlinked processes, not silos."

Reports

 Open access / free of charge

 Banja, M., Sikkema, R., Spijker, E. and Szendrei K., 2019, **Role of national fossil fuel comparators in the nominal emission savings through bioenergy under the RED - case study in six EU countries**, 27th European Biomass Conference and Exhibition, Lisbon, Portugal.

Most bioenergy policies are strongly driven by the ambition to reduce greenhouse gas emissions and substitute fossil fuels. This paper discusses the challenge of properly selecting the fossil fuel 'baseline' comparator for each form of bioenergy for any given national context. A methodological approach for discussing the effect on nominal emission savings due to bioenergy under RED rules taking into account the national fossil fuel comparators is considered, assessing the effects for electricity, heating/cooling and transport in six EU countries. The paper suggests that for including any other effects than CO₂ emissions, it is relevant to select appropriate indicators and use adequate comparators, with enough reference data, for those effects.


 Frieden, D., Tuerk, A., Roberts, J., d'Herbement, S. and Gubina, A., 2019, **Collective self-consumption and energy communities: Overview of emerging regulatory approaches in Europe**, COMPILE project working paper.

The EU Clean Energy Package provides provisions for new energy initiatives, including individual and collective self-consumption as well as energy communities. The transposition into national law leaves significant flexibility. Therefore, this paper looks at the emerging regulatory concepts in the Member States. In many countries, framework legislation is being established that still needs to be detailed. Tariff setting is a core element of the current process of transposition but appears to be a challenging task as it has to consider (1) the impact of energy communities on the system and (2) guarantee a reasonable distribution of system costs over all customer groups.


 Global Commission on Adaptation, 2019, **Adapt Now: A Global Call for Leadership on Climate Resilience**, Global Center on Adaptation, Rotterdam, Netherlands & World Resources Institute, Washington, United States.

The report puts forward a vision for how to transform key systems to be more resilient and productive. The

Commission finds that adaptation can produce significant economic returns. The overall rate of return on investments in improved resilience is high, with benefit-cost ratios ranging from 2:1 to 10:1, and in some cases even higher. The five areas the report considers are early warning systems, climate-resilient infrastructure, improved dryland agriculture, mangrove protection, and investments in making water resources more resilient. Climate adaptation can also deliver a "triple dividend"—it avoids future losses, generates positive economic gains through innovation, and delivers additional social and environmental benefits.

 Mayer, J., Van der Gaast, W., Bachner, G. and Spijker, E., 2019, **Qualitative and quantitative risk assessment of expanding photovoltaics in the Netherlands**, Environmental Innovation and Societal Transitions.

Expanding photovoltaics (PV) is important for reaching Dutch renewable energy and climate targets. In this paper, risks of scaling up PV in the Dutch electricity sector and economy are assessed. With a computable general equilibrium model setup to analyse scenarios until 2050, it is shown that increasing PV shares initially lead to higher costs of electricity supply and thus retail prices. Until 2025, large storage investments will be required, leading to lower consumption possibilities presenting a critical barrier to initiate PV expansion. However, from 2025 onwards PV installation costs are expected to become competitive to wind power, leading to lower costs of electricity supply and electricity retail prices, with positive macroeconomic effects. Overall, positive long-term effects of PV expansion on GDP, welfare and employment from 2025 until mid-century were found. With stakeholders then system-level obstacles for PV expansion in the Netherlands were investigated. A key observation is that inconsistent policy mixes are an obstacle to successful PV implementation.

 Michaelowa, A., Hermwille, L., Obergassel, W. and Butzengeiger, S., 2019, **Additionality revisited: guarding the integrity of market mechanisms under the Paris Agreement**, Climate Policy, vol. 19, no. 10, pp. 1211-1224.

This paper provides recommendations on how to operationalize additionality under Article 6. It is argued that the possibility of 'hot air' generation under nationally-determined contributions (NDCs)

requires an independent check of the NDC's ambition. If the NDC of the transferring country does contain 'hot air', or if the transferred emission reductions are not covered by the NDC, a dedicated additionality test should be required. Bold approaches are needed for assessing additionality of policies. To avoid cumbersome assessment of all activities triggered by such policies, highly aggregated approaches are suggested, ranging from payback period thresholds for technologies mandated by regulation to minimum price levels triggered by carbon pricing policies. Over time, the stringency of threshold values should increase.

6 Spijker, E., Anger-Kraavi, A., Pollitt, H. and Van der Ven, D.-J., 2019 (forthcoming), Evaluating integrated impacts of low-emission transitions in the livestock sector, Environmental Innovation and Societal Transitions.

This paper provides the results of a combined qualitative and quantitative assessment of key impacts for two low-emission transition pathways for the Dutch livestock sector. These impacts or side-effects can be positive or negative. Both pathways were designed to meet a sector specific methane emission reduction target of 33% in 2030 (relative to 2005). The qualitative assessment with stakeholders resulted in developing off-model quantifications to better reflect expected changes in system dynamics and development of more realistic transition pathways used for macro-econometric (E3ME) and environmental (TM5-FASST) modelling. It was found that each low-emission transition pathway has a unique footprint of positive and negative impacts. This footprint is largely shaped by the combination of existing and new technologies, infrastructure, practices, and behavioural patterns. The analysis and results are considered relevant for climate policy and governance processes where there is a need to develop transition pathways that meet different sustainable development goals.

6 Von Unger, M., Greiner, S. and Krämer, N., 2019, The CDM Legal Context Post-2020, Climate Focus, Amsterdam, Netherlands & Atlas Environmental Law Advisory, Berlin, Germany.

This paper discusses the continuity for the Clean Development Mechanism (CDM) after 2020. It may be argued that the CDM becomes devoid of meaning with no future commitment period of the Kyoto Protocol on the horizon. However, under the rules of the Protocol, the end of a commitment period does not end the eligibility of countries to engage in the CDM. The

authors argue that the CDM retains its core purpose: i.e. allowing developing countries to benefit from project activities resulting in certified emission reductions (CERs) and assisting them with achieving sustainable development. A temporary solution could be established for the use of the institutional structure of the CDM (including its infrastructure) for the Paris purposes under Article 6.4 until the Article 6.4 mechanism proper becomes available.

6 World Bank, 2019, State and Trends of Carbon Pricing 2019, World Bank, Washington, United States.

Every year this report presents the latest developments in carbon pricing around the world. This report reveals a mixed bag. A growing number of jurisdictions are implementing or planning to implement a carbon tax or an emission trading system, with important developments in among others Canada, Singapore, and South Africa. But it is not enough: only 20 percent of global GHG emissions are covered by a carbon price and less than 5 percent of those are currently priced at levels consistent with reaching the temperature goals of the Paris Agreement. Swift action is needed: carbon pricing is the most effective way to reduce emissions and all jurisdictions must go further and faster in using carbon pricing policies as part of their climate policy packages. This year's report goes beyond its traditional focus on explicit carbon pricing and, for the first time, also looks at implicit carbon pricing. Many countries are already implicitly pricing carbon through other policies, such as fuel taxes or fossil fuel subsidies reforms.

JIQ Meeting Planner

17-18 February 2020, Karlsruhe, Germany

Final STORE&GO conference: integration of power-to-gas into the future European energy system
storeandgo.info

27-30 April 2020, Delhi, India

Adaptation Futures 2020: 6th International Climate Change Adaptation Conference
adaptationfutures2020.in

26-28 May 2020, Barcelona, Spain

Innovate4Climate: mobilise finance towards climate action
cvent.com

3-5 June 2020, Dresden, Germany

Dresden Nexus Conference 2020: Circular Economy in a Sustainable Society
2020.dresden-nexus-conference.org

22-26 June 2020, Brussels, Belgium

EU Sustainable Energy Week
eusew.eu

19-23 October 2020, Netherlands

Climate Adaptation Week with events in Groningen and Rotterdam, and on 22 October the Climate Adaptation Summit in Amsterdam
climateadaptationsummit.gca.org



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