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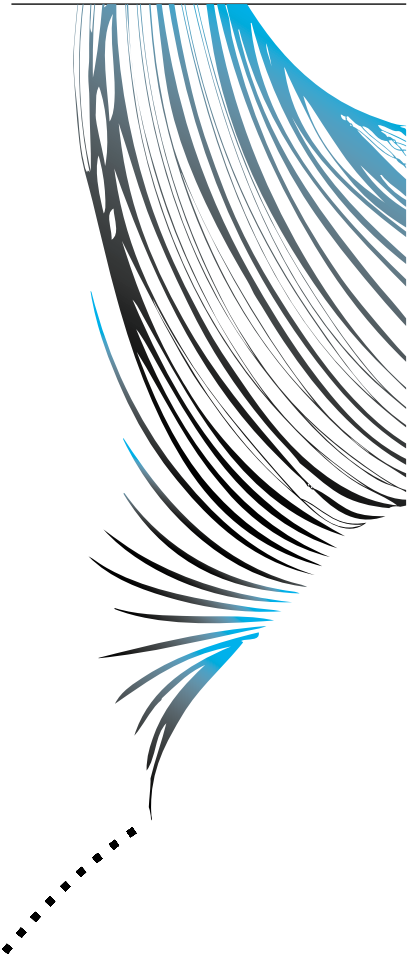

THE LONG AND WINDING ROAD: REFLECTIONS ON DEVELOPMENTS WITHIN GENDER AND ENERGY RESEARCH

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A few months ago, I was invited to give a presentation at a gender and energy workshop at the University of Sheffield in which I was asked to cover my own involvement in the development of gender and energy as a research field. This set me thinking about how I came to be involved in this topic and looking back at influences on my life that shaped my world view which are incorporated into the research path I have followed for more than 40 years. I apologize to those of you who have already heard some of these anecdotes. I start with a section entitled 'A brief history of Joy'.

A BRIEF HISTORY OF JOY

One of the events which shaped my future direction took place before I was born and has a 'gender issue' at its heart. In the 1930s, my paternal grandfather left the family home and my grandmother found herself with four children to raise single-handed. The cultural norm in Europe at that time was that it was not common for a married woman, particularly with children, to work outside the home. This continues to be the cultural norm in many parts of the world, although overtime this changes. My grandmother was fortunate since she had a skill that she could draw on – she knew how to run a bar since this was her father's profession. This gave her not only an income but also a roof over her family's head since the bar came with generous accommodation above the bar – which enabled her to keep an eye on her children. This was an early lesson for my father in the value of women's

education. I overheard him at a family gathering, when challenged about why I was still at school when I could be out earning a living and contributing to running his household before I got married, retorting that there was no guarantee the husband would always be there to support his wife and that she should always be in a position to support herself – good quality education would open the door to a good income.

An illustration of cultural norms about what is acceptable behaviour for women surfaced at another family gathering. I was asked by relatives what I was going to do when I grew up – I suspect that they expected to hear: nurse or teacher – a common choice for girls in the 1950s. A train driver I proudly announced – since walking home from the swimming pool I would see steam trains passing by and the driver hanging out of the cab waving at us kids – what I great job I thought. 'What? You can't do that!' was the astonished reaction. 'Why not?' I said with all the righteous indignation of a 7-year-old. 'Girls can't' was the proffered explanation. 'Why not?' – 'Because they can't'. This line of argument was going nowhere, and it wasn't something I was going to easily accept which is an attitude some of you might recognise. I never did become a train driver – although I have taught combustion and steam generation and maintain a great enthusiasm for steam trains. I am pleased to report that women are now 'allowed' to be train drivers. An illustration that cultural norms do change.

Cultural norms related to women's roles have popped up many times on my path through life. They appeared in secondary school when deciding about which subject to choose to study at university. History was (and still is) my passion. However, in the 1960s the number of places for studying history was a lot less than now and competition was fierce. There was an unofficial quota for the number of women to be admitted (this is before the 1975 Sex Discrimination Act in the UK). The rationalisation was that they only went off and had babies which was a waste of a place – so gender norms still held about women not working once they had a family. I opted for a subject with less discrimination in its admissions policy: Chemistry. My university education took place in the context of the dawning of the environmental movement which increasingly identified the chemical industry as a villain. In the 1960s and 70s awareness of environmental problems was in its infancy. The publication of Rachel Carson's book 'Silent Spring', which I had read at school, is often credited with initiating the environmental movement by drawing a broad audience's attention to the negative impact of synthetic

pesticides on bird populations. Another publication[1] brought more problems for chemists with the prediction that the world would run out of mercury by the 1980s[2]. What about thermometers? How could you do chemistry research without thermometers? A worrying thought that must have kept some chemists awake at night. Another environmental issue which emerged in the 1970s creating discomfort for chemists, since chemistry was the cause of this problem: ozone depletion. After graduation I couldn't decide what to do with my life, so I took a year's interregnum to reflect, filling in time by doing a teacher's certificate. After which, I found myself back in the laboratory looking at trying to solve the ozone problem[3],[4]. Outside of the lab, I was involved in environmental activism for which having an understanding of chemistry came in very useful and helped create my first experience of trying to influence energy policy. From 1974 to 1977, I was a member of the British Government's Advisory Council on Energy Conservation presenting the young person's perspective to the Minister for Energy. One of the books I read during that period also influenced my world view (and many other young people): 'Small is Beautiful' by Fritz Schumacher. The sub-title of this book is 'A Study of Economics as if People Mattered'. Schumacher argued that the modern economic system was leading to the depletion of natural resources —in particular, large industries and large cities were major contributors to that depletion. He was particularly interested in rural development in the Global South which he felt should be small-scale, using local materials and the skills located in communities. Simple local-cost technologies (referred to as 'intermediate' and later 'appropriate' technologies) were at the heart of his vision. To demonstrate the validity of his ideas he set up, in 1965, the NGO ITDG[5]. His philosophy would have an influence on the way my career and my thinking about technology developed.

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[1] 'The Limits to Growth' by Meadows et al. (1972).

[2] I am pleased to say that this prediction has not yet materialised.

[3] This is a topic we don't hear so much about nowadays since a solution was found in substitutes for the chemicals destroying the ozone and their use enforced through the UN's Montreal Protocol.

[4] As aside I can offer a claim to fame by association. As a student, your first scientific conference when you present a paper is always nerve wracking. I was the first paper to be presented in the morning after the conference reception, only one person in the audience wasn't suffering from the previous evening and he was the only one who asked a question! That was scary because he was the top researcher in the field. I must have done OK because he hinted that he'd consider me for a post-doc which I didn't follow-up. I missed the chance of going to work for someone who later won the Nobel Prize for Chemistry.

[5] The Intermediate Technology Development Group now known as Practical Action.

During the 70s, I was also involved in the women's movement which campaigned on a range of issues, challenging cultural norms and values, such as women having control of our bodies and lives.
At this point in time energy didn't particularly feature as an aspect of my research interests although a global energy crisis did have a practical impact on daily life: oil prices rose dramatically in the context of the conflict known as the Arab-Israeli Six Day War. In the UK, we also had a strike by coal miners which resulted in blackouts and studying by candlelight – unfortunately a continued lived experience for many people around the world.

In 1980, there came another pause for reflection on what to do next, with a need to earn an income, I found myself at Reading University as a member of the Energy Group in the Engineering Department not initially as a researcher but as an administrator. The Group was headed by Professor Peter Dunn who it turned out was a good friend of Schumacher and had helped set up ITDG's Energy Panel. Indeed, the Engineering Department's research site gave a home to several ITDG staff to conduct their experiments. Reading focused on renewable energy for both the Global North and the Global South. In the lead-up to the United Nations Environmental Programme meeting in Kenya in 1982, the Group was contacted by the UK's Overseas Development Administration (ODA) which need a quick (and cheap) announcement to make at the meeting. The ODA offered funds to set up a Masters Course in Alternative Energy for Developing Countries. Prof Dunn agreed and we set about planning the course. At one meeting, which was to change the direction of my life, Prof Dunn announced he had staff to cover all the energy sources except for biomass and biofuels. He looked at me: 'you're a chemist - you can do it' – 'but I don't know anything about it' was my reply – 'you have 6 months to find out' was the retort.

BECOMING A BIOFUELS EXPERT

The path to becoming a biofuels expert involved an extensive literature review and I encountered a research paper 'The Other Energy Crisis: Firewood' by Erik Eckholm published in 1975. This paper is regarded as a seminal publication. It drew the world's attention to 'the other energy crisis': the fuelwood shortages being faced by the majority of the world's population most of whom resided in the South. (This was at the time that I referred to earlier when the Global North considered that the energy crisis was the threat to a continuous supply of oil at affordable prices.) Fuelwood was the energy source used throughout much of the Global South to cook food and boil water to make it potable. Fingers were pointed at rural people for causing the problem by chopping down trees which was also, it was alleged, causing deforestation[6] (Leach and Mearns 1988). The primary response to this crisis in the South from the Global Community represented by the United Nations and the development agencies, such as the Netherlands's DGIS, was support for farm-based wood lot projects.
An interesting aspect of this intervention, from a gender perspective, is that one of the objectives was that women were actually identified as the direct beneficiaries since they were considered to be the main fuelwood collectors and users within their households. In particular, wood produced in this way would help save women's time. However, this well-meaning technocratic solution failed to consider the social relations of gender. The trees either didn't get planted, since women usually did not own the land and had no right to plant trees, or if they did get planted, women did not have the right to cut them down nor once the trees had been cut could they control the use of the resource – men owned and controlled the resources (Leach and Mearns 1988). Nor were women always the collectors of wood. Here we had some of the first evidence demonstrating how gender relations directly impact on energy outcomes.

The alternative response to finding a solution for the fuelwood crisis was to switch attention to improving the energy efficiency of stoves either by redesigning the stoves or providing alternative cleaner fuels. Again, a technocratic response without understanding the context. Stove design was usually conducted by male engineers from the North, while the primary uses

[6] There is a significant body of evidence to challenge this generalisation with felling for commercial timber being identified as the major culprit (Arnold et al. 2003; Masera et al. 2015).

of the technology, women in the South, were excluded from the design process. This is where I came in. I had the solution in the form of a gas, called biogas, with similar properties to natural gas – burning with a clean high temperature flame. Ideal for cooking and no need to walk long distances to collect wood since it could be produced by material readily available in rural areas (cow dung). You produce the gas in situ by mixing the dung with water and put it in a sealed container and at ambient temperatures after a few days you get not only the gas but also an excellent fertilizer. Problem solved for millions of rural women! However, these millions of women didn't seem to agree with me, because digesters, apart from in rural China, were not being installed at scale. Why not? Clearly, I had not learned a very important lesson from the experience with fuelwood lots: women don't decide about the use of their households assets. Men didn't want to invest in the cost of a digester, plus a new stove and pans, since they didn't see the benefits. At this point I had not been to the Global South, so I had no idea about the realities of people's lives. If I had I would have realised that, if you don't have piped water, which was rare for rural households, you are swapping wood collection for water collection – so biogas offered no time and labour saving. Now in hindsight, it is no wonder that women, even if they had the assets to buy a system, were not keen to adopt this technology.

TWENTE BOUND

The next change in direction of my career path, which brought a better understanding of the technology system, came when, in 1984, as part of the preparation for the Masters Degree, I was sent to the University of Twente to take part in the International Course on Rural Energy Planning (ICREPE)[7] which was a 9-week training course offered by the Technology and Development Group (TDG)[8]. The TDG was an interdisciplinary/interfaculty group with staff, some of whom had an engineering background, who had experiences in the Global South and wanted to contribute to the development of that part of the world. John Burton, my colleague at Reading, had met Wim Hulscher from the TDG at a conference. There was an immediate rapport and a realisation that the two groups could be mutually supportive and learn from each other's perspectives. Prof Dunn recognised

[7] The course was a joint cooperation with ITC which was initially a separate institute and is now a faculty within the UT.

[8] Vakgroep Ontwikkelings Kunde (VOK) was the Dutch acronymn.

that we needed a social science component for our Degree, not surprisingly due to his involvement with Schumacher. Participation in ICREPE would provide a crash course for someone in our degree program and the only person not involved in teaching who could be spared for 9 weeks was yours truly. I thoroughly enjoyed the experience and learned a lot to build on for future research and teaching. One of the little recognised aspects of the Reading Masters was that it was unique as an engineering degree in that a third of the courses were from other disciplines.

My participation in ICREPE was the start of an exchange of teaching staff between the two universities which included visits by me to contribute to the TDG's teaching. In 1989, I was asked by Wim Hulscher if I would like to come to Twente for a year to stand-in for two staff members (Margaret Skutsch and Mike McCall) who were going on sabbatical. It seemed like a good opportunity to build my knowledge and skills but unfortunately Prof Dunn did not share the same vision. My request for leave of absence was turned down. After consultation at home, I handed in my notice and in October 1989 I set off for what, at the time, was planned to be a year in Enschede. That turned out to be a very long year. I am eternally grateful to all the staff from the VOK/TDG who helped me gaining an understanding of the processes of development and the role of energy in those processes.

Initially my main responsibilities were to assist in the running of the two short-training courses offered by TDG. As well as ICREPE, there was the Energy Management in Small-scale industries (EMSI) course which included the possibility to conduct an energy audit in a local small company. These two courses have made important contributions to building the capacity of people in the Global South in energy planning and energy management. They were early contributors in helping to realise Sustainable Development Goal 7[9]. I receive emails from past participants telling me how important participation in these courses has been for their work. I also hear from people in international agencies, that they encounter people in the global energy sector who have been to Twente.

[9] SDG7 aims to ensure access to affordable, reliable, sustainable and modern energy for all. (https://sdgs.un.org/goals/goal7 - accessed 3 January 2024).

A BRIEF DIVERSION FOR ALCOHOL

During my first year at Twente, I was also working on the completion of my PhD which was on the subject of fuel ethanol. I had designed a small-scale system for village level use to provide a clean fuel for running a stationary engine to generate electricity. I was able to spend 4 months in Tanzania at the University of Dar es Salaam with Shukuru Kawambwa, my Masters student, who was also working on the project. It was a very enjoyable time, and I learnt a lot about life in another country. Shukuru and I were back in Reading in time to be asked to be part of the group who would meet President Julius Nyere who was on a tour of the UK before stepping down from office. He had studied in the UK and saw some positive aspects of his country's colonial master, in particular, he was a big fan of Shakespeare. Shukuru and I were very excited to be meeting him and looking forward to telling him about our project to contribute to Tanzania's rural development – a subject close to the President's heart. We were called forward to explain what we were doing. 'What?!' he exclaimed, 'Stop that. They will only drink it!' Another of Joy's technologies given the thumbs down!

I did go on to complete my thesis. Although there was a problem with the distillation I could not solve. I thought that illegal distillers would probably know the answer, but this was not a group you could easily approach to ask questions, and this was the days before the internet, so asking Dr Google was not an option. However, an UT student from Chemical Engineering did solve it during field work in India. He also had the possible answer to President Nyere's objection – give women the control of the still – they were less likely to drink the alcohol! Again, understanding social norms which could be applied to find a solution to a problem created by introducing a new technology.

NEW DIRECTIONS AT THE UT

Over time, my responsibilities within the TDG, began to expand and I was awarded tenure as an associate lecturer which required my building a research portfolio and contributing to the formal teaching of the University. During my tenure at the UT, I have built a substantial body of empirical research work in two areas: initially in biofuels and poverty and later in gender and energy. My research has examined the influence of socio-economic, environmental, cultural and institutional factors of the transfer

of energy technology to a particular society, with its North-South dimensions and the consequences of this process for societal actors. I have been instrumental in the establishment of a new research area of engendering energy policy which includes the application of gender mainstreaming theory to policy formulation and implementation both in the Global South and Global North. I have become a leading international authority in the field of gender and energy. Between 2013 and 2019 I was one of the three editors of the journal 'Gender, Technology and Development'. I have contributed to development practice in respect of gender and energy, for example, I was asked by the World Bank and UN agencies to participate in (funded) advisory tasks, including, preparing a background paper for the 2012 World Development Report. I led a team from the World Bank and UN-Women in developing indicators for the Global Tracking Framework for the UN Secretary General's Sustainable Energy for All Programme. I was asked to appear as an Expert Witness before the Development Committee of the Bundestag in Berlin (2011). Since 2000, my focus has switched to the Global North, specialising in gender and energy issues within Europe.

I continue to have an interest in biofuels, contributing to international debates, using a feminist political ecology approach and a value chains analytical framework, which has resulted in the publication of a book 'Biofuels and Rural Poverty'. I have supervised a PhD student who examined how promoting biofuels in Colombia led to land-use changes and contributed to conflict (Marin 2014). As a consequence, I have been invited as a keynote speaker at conferences and academic fora (eg 2014 World Renewable Energy Congress) as well as being asked to review for academic papers. I have also been asked by the Food and Agricultural Organization to support their work on assessing the potential pluses and negatives of crop residues as an energy which has resulted in a PhD candidate.

I am involved in PhD supervision (1 active and 13 completed) and in PhD defence committees (14 external and 12 internal). I have taught on UT's Master and bachelor programmes in both technical and non-technical faculties drawing on my research to illustrate my lectures. I have made significant contributions to course and curriculum development in the last 35 years including assisting with the establishment of CSTM's Master of Science Environmental and Energy Management taking responsibility for

developing the energy stream which my involvement in the ICREPE and EMSI courses helped in curriculum development to ensure the incorporation of a Global South perspective. I have taught more than 1000 students, many of whom now hold senior positions in the energy sector throughout the world. Within the Netherlands I have been a member of 2 Masters Accreditation Panels. Before my retirement, I was a member, on behalf of the University of Twente, of the Scientific Advisory Board of the Africa Studies Centre, University of Leiden and CERES the Research School for International Development in the Netherlands.

ENERGIA

Perhaps my most significant achievement as a contribution to equitable development has been the establishment of ENERGIA, the international network on gender and sustainable energy. In 2016, I joined forces with Elizabeth Cecelski, Margaret Skutsch and Saskia Everts as a response to our disappointment with the UN's Conference on the Status of Women in 1995 (known as the Beijing Conference) which had little to say about women and energy. We were frustrated that policy makers were focusing on the fuelwood crisis and a very narrow interpretation of household energy as one of stoves. The energy of physical labour in household survival activities, primarily by women, was ignored. Evidence, using time as a proxy indicator for amounts of energy used, showed that women spent more hours than men on meeting basic needs (Cecelski 1995). There was no recognition of women's use of traditional fuels for productive activities (Cecelski 1987). There was a need to address a broader range of issues including pricing, transport and modern energy forms, such as electricity and LPG.

As researchers, we decided that, if progress was to be made with getting gender and energy onto the international agenda, a more strategic approach was required by presenting evidence in a focused, practical and coordinated way. The intention has been to bring together researchers, development experts, energy experts and gender specialists from both the South and the North to exchange experiences, generate data and share analytic approaches. We aimed to bridge the gap and stimulate dialogue between two groups of actors who can sometimes appear to be running on different tracks: firstly, policymakers and those working at the grassroots and, secondly, energy professionals and gender experts.

We were fortunate that a staff member from Dutch Development Assistance (DGIS) shared our concerns. She found us some funds to set up a newsletter! We were astonished and disappointed – we had many more exciting things to do than produce a newsletter. Nevertheless, ENERGIA News was born and I'm proud to say that it still appears today. In hindsight, it was a sensible starting point. Setting up and running an international network involved a lot more work than we'd first anticipated. At the start we took two important decisions. First and foremost, even though the network's administration was, and continues to be, based in the Netherlands[10] it should be run by women from the South. The founders gradually withdrew from running the network, although we have continued at different levels of involvement to support the network acting as advisors and participating in research projects. I am pleased to say that ENERGIA has been for several years operated under the excellent leadership of Sheila Oparaocha. Our second objective was to ensure that there was Southern involvement in guiding the direction of the network. Since we only had a limited budget, we decided to work with existing organisations that had a women and energy interest to act as network partners. So as not to stretch resources it was decided to focus initially on sub-Saharan Africa and later Asia.

However, empirical evidence is needed to persuade policy makers to act. Network members set about generating the evidence related to gender issues and energy use, in particular, showing that these issues were more than cooking. That is not to say that cooking was neglected. Here the aim was to show that this was a more complex issue than providing an energy efficient device.

ENERGIA News demonstrated its value in at least two ways. It provided a useful medium to target policy makers with information about a range of issues beyond stoves. When sourcing for articles, it appeared that the evidence about women and energy was more limited than for other sectors such as agriculture and forestry. ENERGIA has played a major role in generating that evidence including running two major research projects: 'Gender as a Key Variable in Energy Interventions' and 'Gender and Energy Research Programme'. I am proud to have played a part in both.

[10] ENERGIA has been hosted two Dutch NGOs initially ETC Foundation and now HIVOS.

ENERGIA has evolved over time and had produced an impressive body of work. Capacity building has been a strong feature. Training manuals were developed, and courses held, to explain how to mainstream gender into energy policy, projects and practice. The tool of gender audits were designed providing an alternative to gender budgets which were costly to carry out and required a set of knowledge and skills not widely available particularly amongst gender experts in the energy sector. Audits also open up the possibility for women with a broader cross-section of experiences, knowledge and skills to be involved in contributing to policy formulation. However, as my PhD student Svetlana Frenova found, at least in the context of UNFCCC[11] processes, that participation by women's organisations can be mainly symbolic since they lack both the experience of participation in such fora and the technical knowledge of the subjects under discussion (Frenova 2021). In an evaluation study of the impacts of gender audits carried out in the energy sector of several countries I carried out with Nthabi Mohlakoana, we found some positive steps towards a more gender equitable energy policy in formulation and implementation (Clancy and Mohlakoana 2020). It appears that in organisations that participate in audits gender-aware policies are rapidly adopted. Male employees more readily accept gender policies when they see that such policies also benefit men. National gender and energy experts were increasing in number which results in a great degree of self-determination rather than relying on outside experts (particularly from the Global North) for gender mainstreaming in the energy sector. There were also men becoming gender and energy champions.

A CHANGE OF DIRECTION

Most of my research work related to gender and energy started with a focus on the Global South. It therefore came as a surprise when in 2000, I was asked to lead a team to make an evaluation from a gender perspective of the European Commission (EC)'s 'Fifth Framework Programme on Energy, Environment and Sustainable Development Research' and 'Training in the field of Nuclear Energy'. My initial reaction was: I'm a woman living in the European Union (EU) who does research on gender and energy but I've no idea about this topic in the European

[11] United Nations Framework Convention on Climate Change

context! This gave me a chance to find out - with the consequence that a substantial part of my research since then has focused on the Global North.

The first study had two overall objectives. The first objective was to determine the extent to which both women's and men's concerns and experiences were integrated in the design, implementation, monitoring and evaluation of the European Commission's policies and programmes that relate to non-nuclear and nuclear energy so that women and men benefit equally. The second objective was to ensure that the inequality of women with men in this context is not perpetuated. We used an analytical framework of three components: research by women (what women are doing in energy research); research for women (what are women's priorities and are they the same as men's); and research on women/gender issues in employment (do women experience different career problems to men?). One of the first challenges was that there was little statistical data disaggregated by sex. Eurobarometer did not disaggregate by sex or any other socio-economic characteristics. Indeed, gender was not seen as a socio-economic factor. This made it difficult to make definitive statements about the impact of women researchers in the European Research Area as well as energy research on women's lives. The evidence pointed to women tending to favour renewables and energy conservation over fossil fuels and opposing nuclear energy. However, as with many such statements related to gender and energy, they get simplified and treat women as a homogeneous group. For example, it's not unusual to read 'women oppose nuclear power', however, I interviewed a couple of women who worked for the nuclear industry, and they were some of the most enthusiastic advocates of nuclear power that I have ever encountered, and I write that as chemist. In terms of working in the energy sector, it was encouraging to see that it was proving an attractive career option for women, although there were barriers such children and the masculine culture in the workplace. However, when it came to research, there appeared to be only a small number of women energy professionals making up the cohort who were not evenly distributed by subject area (physical, technical, economic, institutional, and social). There was no evidence that gender dimensions had been considered when formulating the Energy Work Programmes. We attributed this to a general lack of awareness of what constituted gender issues and gender-oriented research and, so unsurprisingly, there was a lack of capacity to incorporate

these questions into the programmes. We proposed a set of indicators to try to make statistics more meaningful for a wider audience and provide evidence for advocacy: enabling indicators (eg, institutional structure, policy environment); input (allocation of human and non-human resources); process (use of resources during delivery and monitoring); output (attainment of immediate objectives); and outcome (monitor long term changes).

Since that piece of work, I wrote a paper together with Ulrike Roehr in 2003 in which we set out to test the assumption that within the Global North women and men were equal in their uses of and views about energy, consequently policies equitably accurately reflect the needs and wishes of the population (Clancy and Roehr 2003). I am surprised to see that this paper is still cited. At that time, there was very limited data, but we did detect a distinct gender dimension in the way energy use affected women and men's lives. However, when it came to decerning gender differences in preferences for which primary energy forms should be the basis of supply there was little empirical evidence to draw distinct conclusions apart from the indications that women were less likely to support nuclear energy than men.

Since writing that paper, I have led three studies commissioned by the FEMM Committee of the European Parliament. The first study reviewed through a gender lens the existing EU legislation and policy related to addressing energy poverty linked to a resolution on access to energy adopted in December 2016 by the European Parliament (EP) (Clancy et al. 2017). To demonstrate to policy makers of the importance of addressing energy poverty in a gender-aware way, we described the gender dimensions of living in energy poverty using the conceptual map of the drivers, causes and effects of energy poverty developed by Trinomics (2016). We also showed that gender and energy poverty can be analysed from three interlinked perspectives: Economic: e.g. households with low levels of income are disproportionately found to have women at the head as either single parent families or, living alone at pensionable age due to their greater longevity than men; Biological/physiological: e.g. Age is a significant factor in who experiences heat and cold stress, with young children and older people being particularly vulnerable. In general, women are also considered to be more sensitive to ambient temperature than men. Socio-cultural: women's energy needs and consumption patterns

differ compared to men but also between women, factors like marital status and employment influence energy consumption. These perspectives underlined the need for intersectional data since variations in cause and effect are linked to socio-economic characteristics. The report complained about the lack of sex disaggregated data. An important contribution of the study was drawing the attention of a wider world to the use of fuelwood for cooking and space heating in parts of Eastern Europe. There was already existing extensive epidemiological evidence that linked several respiratory and other diseases to exposure to wood smoke. However, policy makers have been reluctant to accept that a condition usually associated with the Global South could be prevalent in the Global North.

The second study was to help ensure that gender equality is a component part of the transition to the sustainable energy model advocated in the EU (Clancy and Feenstra 2019). We examined three roles women could play as change agents in the energy transition: energy professionals; energy decision makers: and energy consumers. There was the same complaint as for the previous two studies: a lack of sex-disaggregated data. The energy policies of many EU Member States appeared to be gender blind while gender approaches could not be identified in policy implementation. The limited empirical evidence was rather inconclusive about women's employment and whether their income will benefit from modern energy access. There was some evidence to suggest a gender difference in decision making about household appliances with women tending to be greener than men and more likely to feel guilty about the impact of their ecological footprints.

The third study provides an analysis as to (i) whether a gender dimension has been incorporated in the initiatives proposed under the Fit for 55[12] package and (ii) whether a gender-sensitive approach was used in policy formulation (Clancy et al. 2022). I had the honour to present the study to the FEMM Committee of the European Parliament in October 2022. To make the analysis we used the three dimensions of the energy justice

[12] Fit4Fifty-Five is the umbrella name given to the package of measures which aim to ensure that the EU's climate goal of reducing EU emissions by at least 55% by 2030 is reached. https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/ (Accessed 6 December 2023).

framework (distribution, recognitional and procedural) viewed through a gender lens as first promoted by my PhD student Marielle Feenstra (Feenstra 2021). By taking this approach, we aimed to provide a more nuanced understanding about how the energy transition may unevenly distribute benefits, costs and risks, thereby producing new inequalities or exacerbating existing ones. We wanted to go beyond an analysis of energy poverty related to income, to make a more detailed analysis of the social distribution of the energy transition by taking an intersectional approach (Yuval-Davis 2016). Again, our analysis was constrained by the limited availability of disaggregated data. It appears that we were not alone in feeling frustrated by the lack of data. The European Court of Auditors has also criticised the Commission for the lack of gender-disaggregated data which they consider has hindered the analysis of gender mainstreaming (European Court of Auditors 2021). An interesting aspect of this study was the range of issues now under consideration by researchers compared to the first study I was involved with. Energy poverty is receiving a much more nuanced understanding including moving beyond a label to the recognition of its negative impacts, such as social isolation and mental health.
The adoption of the concept of 'hard-to-reach-users' as used by the International Energy Agency was also recommended. It is not only people on low incomes who need help to contribute to the green energy transition but also people on high incomes who have sufficient income to meet their energy bills. This latter group needs to be persuaded to lower their energy consumption to reduce the accompanying environmental impacts.
Another group, we identified as needing support against rising energy prices but are usually excluded from existing energy consumer protection or are overlooked in advice on energy efficiency improvements are the type of small businesses, such as hairdressers or coffee shops, where many women are employed[13].

In terms of encouraging more girls to study STEM subjects there are some very good initiatives within the EU to challenge gender stereotypes as they influence career motivations, for example educational toolkits for teachers and students related to the transport sector (European Commission,

[13] Women make up over 60% of employees in service, sales and clerical support of which many will be in part-time, temporary, low-paid and precarious employment (European Commission 2022).

Directorate-General for Mobility and Transport et al. 2021). However, research in the Netherlands indicates that one needs to understand the norms and values of communities which influence what constitutes appropriate employment for women and men which in turn influences study choices (Feenstra et al. 2022). Negative perceptions about the nature of the work in a particular field, such as engineers building a wind turbine (dirty, dangerous and possibly working away from home), have to compete with the positive perceptions of the IT industry (smartly dressed, based in an air-conditioned office with a daily commute from home).

PLUS ÇA CHANGE, PLUS C'EST LA MÊME CHOSE

When I came to prepare my presentation in Sheffield, I realised it was some time since I'd looked at the first study for the European Commission. So, when I looked at the report I was surprised and disappointed at how much overlap on the Venn diagram of findings from that first study and the most recent – after 20 years there are nevertheless the same issues. First and foremost, we are still lacking data disaggregated across social characteristics. Women working in the energy sector or as a researcher face the same issues. The energy sector continues to have a masculine image, for example, physical strength is a required characteristic to work in the sector, which is dominated by men aged 50 and above, particularly in the technical areas. This will potentially be problematic for the energy transition in which many of the jobs are considered to be in the construction sector, which is male dominated. Women working in the energy sector work tend in administration, sales, finance, catering and personnel. The lack of women in senior positions is attributed to the way the appointments process is made. While open application procedures might be in operation, 'suitable' candidates, who are identified through "old boy networks", which then tend to be men, are encouraged to apply. When women do manage to find a job, they can find themselves in an organisational culture that sees men's ways of working as 'the norm' and does not readily embrace ways that many women prefer, such as a collaborative approach (Moodley et al., 2016) which creates a feeling of exclusion ('you are not one of the boys') (see for example: Young Women's Trust, 2016). Employment policy which does not support childcare is still a contributing factor to women leaving the energy sector either completely or going part-time neither of which is positive for their career development or building a reasonable pension.

LEARNING FROM EACH OTHER

As I stated earlier, I started my research on gender and energy initially with a focus on the Global South and later I came to work in the context of the Global North. An important lesson has been that there is much that researchers from different contexts can learn from each other. To illustrate this point, I have selected three areas.

Energy access/Energy Poverty

Improving access to clean energy to rural households in the Global South has been a central focus of development for many years and is now enshrined in SDG7. While in the Global North, it is assumed that the technical infrastructure is in place for everyone to have access to clean energy and the problem is one of insufficient income to pay for the energy services the household would like to use a condition which is known as living in energy poverty. As was pointed out earlier that not everyone, at least within Europe, has access to clean energy with a significant number of households cooking on wood or peat (in the case of Ireland). There is a significant body of medical research built up in the Global South on exposure to wood smoke so there are plenty of lessons learned for the Global North to draw on. However, we should consider that there are other health issue related to energy use. One of the impacts of energy poverty is social isolation, for example, when people feel that they cannot invite a neighbour for coffee because their living space is not comfortable, which can lead to mental health problems. There is resistance in rural Ireland to giving up using peat because it is considered part of cultural identity[14]. However, anyone familiar with social practice in rural South Africa would tell you that, despite what energy source is used in the kitchen, cultural norms ensure that fuelwood will still be collected and stacked outside the home since its size is a measure by which your community judges you as a 'good wife' (Matinga 2010).

Time Poverty

It is not uncommon to read in the grey literature (see for example, UNDESA 2018) that women suffer from time poverty linked to the limited access to labour saving household equipment which could be used to fulfil

[15] https://www.theguardian.com/world/2022/may/04/were-being-left-with-nothing-irelands-turf-wars-expose-rural-grievances (accessed 5 January 2024).

their care tasks in the household. However, the acquisition of labour-saving equipment does not necessarily lead to time saving. Other things change too which influence equipment use, for example, increased income can be used to buy more clothes and standards of cleanliness change, washing machines allow for clothes to be washed more frequently (Bell et al. 2015; Bonke and Jensen (2012) cited in Knapková and Považanová (2021)). This illustrates the point that conditions, such as time poverty, are not consistent across time or geography.

Therefore, as outsiders to a community we researchers and development practitioners are aiming to help, we should always question our assumptions and ask our target group for their opinion. For example, do rural women who collect fuelwood consider this is an inconvenience and whether it is the priority amongst the many problems they face which require a solution. Water provision for the household might contribute more to women's time poverty than wood collection. A study in the early 1990s in a resource-deficit area in eastern Zimbabwe (Chiduku Communal Area) found that women spent 4.1 hours a week collecting fuelwood and 10.3 hours on water (Mehretu and Mutambira 1992).

Micro-enterprises and income poverty

There is an instrumental argument for promoting women's entrepreneurship in that it potentially has positive impacts on household income and contributing in the long-term to providing financial support for women's life in retirement. There has been considerable interest from gender and energy practice in the Global South in promoting women's entrepreneurship in the energy sector or improving energy access to benefit women's enterprises. There has been considerably less interest, at least from a gender perspective, about energy and enterprises in the Global North. In general, there has been limited interest from researchers with a background in entrepreneurship. As a consequence, our knowledge about energy and women's enterprises is largely codified in the non-academic literature with a focus on the Global South. There is little attention given to men's enterprises and data are rarely presented disaggregated intersectionally. One three country study, as part of the ENERGIA Gender and Energy Research Programme, found that in Ghana monthly total expenditure across all fuel types was the same for women and men, whereas in Tanzania men's expenditure was higher than women's (IDS and GIZ 2019). The evidence pointed to men in both

countries doing better financially than women, although the authors considered the difference not to be statistically significant. Interestingly in Ghana, women had significantly more customers than male-owned enterprises. Depending on your perspective you can draw different conclusions from this finding. Women are providing a positive contribution to the range of services provided in the local community or they might not be generating sufficient levels of income to invest for their retirement.

There are similarities between women's micro-enterprises globally. There appears to be limited differentiation in the products and services (de Haan 2016). Women are predominantly found in the service industry, retail and hospitality. If these businesses are run from micro-enterprises they can be based at home or the enterprise can be in a location requiring rent. In the former case, the household as the enterprise location is recognised as common practice in the Global South, it is less recognised in the Global North, although the COVID pandemic appears to have increased the numbers of women running businesses from home in the UK[15].
A home-based entrepreneur can miss out on government financial support to promote energy efficiency if the enterprise's activities cannot be distinguished from other household activities. In the situation where the entrepreneur is a tenant, the property owner might be reluctant to improve the energy efficiency of the building if there is no personal financial benefit. In the European Union, the energy consumer protection framework in place in the 2020s did not provide micro- and small-enterprises with the same safeguards offered to households which resulted in business closures and unemployment (Clancy et al. 2022).
To adapt an enterprise, for example to improve energy efficiency and reduce costs, or set-up a new business requires investment in equipment which necessitates finance. Yet, women face higher barriers than men in accessing finance. This is a global issue. Data for Europe shows that of the capital invested in European technology companies 91% went to all-male founding teams while 7% went to mixed teams and less than 2% to all-female teams (European Commission 2022).

15 https://www.rbcwealthmanagement.com/en-eu/insights/the-growth-of-female-entrepreneurs-despite-a-pandemic (accessed 5 December 2023). The data source for this statement is unclear. However, I've included it as a pointer for an area for research.

A WAY TO GO AS A RESEARCH AREA: SOME CONCLUDING REMARKS ON GENDER AND ENERGY

In this final section I will offer some suggestions, based on my experience, for researchers on gender and energy and policy makers in the energy sector. There is still a lot to do – new issues emerge the more we look. In this section I draw attention to some of these issues, as well as the nature of the data we collect.

We need more data

There are significant gaps in knowledge which data forms the foundation for building our knowledge and understanding the nature of those gaps. Existing data in respect of a range of issues, in both the Global South and Global North, tends to be qualitative based on case studies with a short time horizon. Change takes time which requires longitudinal studies. A good example of longitudinal studies is the British Attitudes Survey[16], which since 1983, based on a representative sample of the population, has been measuring and tracking changes in people's social, political and moral attitudes. For example, in 1987, 48% of the sample agreed with the proposition that it is a man's job is to earn money and a woman's is to look after the home and family while in 2022 this had decreased to 9%.

Project outcomes are often aspirational and based on assumptions. For example, it is not unusual to read that street lighting enables women to go outside at night (see for example, Davis 1998). Here the assumption is that social values, particularly as relate to notions about women's morality, will change sufficiently quickly that women are confident that by leaving the home at night their social status is not at risk. This was certainly found to be case within a hill tribe area in Northern India, where after the introduction of streetlights, the social norms were sufficiently strong in respect of the morality of a woman who went out alone at night to act as a barrier to women going out after dark (Kelkar and Nathan 2007).

Energy access in the Global South has focused primarily on improving the energy infrastructure in rural areas which have been underserved by suppliers of modern energy and at the household level on improved

[16] https://natcen.ac.uk/british-social-attitudes (accessed 5 December 2023).

cookstoves. Research has paid only limited attention to urban areas taking mainly a sectoral focus with a clear neglect of gender particularly in relation to energy and livelihoods (Clancy 2006). However, a three-country study (Nigeria, the Philippines and Brazil) which examined energy use in an urban context found that while energy availability might be better than in rural areas, poor urban households still had access challenges, not all cost related (Clancy et al. 2007). The study also examined the gender dimensions related to energy. Urban women like their rural sisters had, relative to men, limited capabilities, lacked productive assets and resources and received low rewards in the labour market which restricted their energy choices for household uses. Urban migration by rural men who are living without a partner and have never learned to cook may resort to paying for cooked food, often at informal road-side restaurants which raised issues related to hygiene and diet.

Another under-researched aspect of urban areas are informal settlements which can form the living space for a significant part of the urban population. For example, it appears that 60% of the population of Nairobi, Kenya, lives in informal settlements (Anditi 2022). Households find it difficult to access modern energy sources since utilities are often reluctant to provide a service where there are doubts about the legal tenure of property and where the dwelling is not considered to be a permanent construction. Households may resort to illegal connections which can be unreliable and dangerous with hook-ups being made without the usual safety mechanisms. Unfortunately, many utilities tend to see such households as a problem rather than as potential clients. Generally, utilities resort to removing the connections instead of working with these households to develop innovative ways that would be mutually beneficial (Clancy et al. 2007). Informal settlements, at least in Kenya, fall outside of the government's energy interests which have a distinct rural-urban focus (Anditi 2022).

We find the opposite in the Global North, in that attention is paid to energy issues in urban areas, particularly the issue of energy poverty. However, an emerging issue is transport poverty which has its gender and energy dimension and distinct rural/urban differences (Lucas et al. 2016). Transport poverty can be defined as situation in which a person is not able to make a journey to meet their daily needs, for example for health, education, employment, shopping or social activities. Women are more

likely than men to experience transport poverty since they (particularly older women) are less likely to have a driving licence and are therefore reliant on public transport and walking. Rural and suburban public transport systems are less developed than those in urban areas. Routes are often planned following radial patterns to connect suburbs or rural areas to city centres with schedules set around commuter travel hours (Sansonetti and Davern 2021). Given women's reliance on public transport, inadequate rural and suburban public transport systems contribute to their transport poverty. However, this is an under-researched area – particularly from an intersection perspective.

Another subject about which there is very little data, which is linked to the sensitive nature of the issues, is about energy access for people living in displaced person camps (MSF 2005; Kasirye et al. 2009). Women may be exposed to sexual and other forms of violence when collecting fuelwood and carrying out their daily survival tasks, including water collection and staple food preparation (see for example Matinga 2010). Cultural norms can discourage women from reporting sexual assaults. However, of the reported rapes for displace person camps in West and South Darfur, Sudan, it was estimated that 82% occurred outside the camps while the victims were searching for firewood, water or animal fodder (MSF 2005). During the Bosnian War in the 1990s, women in Sarajevo, while gathering fuel, reported incidents of physical and psychological violence, for example, from sniper fire (ESG and CSD-NGO WC 2001). Men can also suffer physical violence when trying to collect wood in such situations. A study in displaced person camps in Northern Uganda reported that men and boys were concerned about the safety of their female relatives so had taken over responsibility for fuelwood collection. However, they were subject to physical assaults from armed gangs (Kasirye et al. 2009)[17]. Yet without this harrowing data, addressing energy access in this situation would continue to be neglected.

I accept the need for quantitative data. Quantitative research shows the "what" and "how much" aspects of a problem. It is what convinces policy

[17] Mr Kasirye is a graduate of CSTM's Master of Environmental and Energy Management. It has been an honour to supervise him. He grew up in a displaced persons camp and wanted to draw attention to the daily situation related to energy access experienced by families. I admire him for having the courage of his convictions to initiate this study, one of the first in the world.

makers who require an estimate of the scale of a problem and the financial costs of any interventions required to fix it. However, to fully support this type of research requires large scale, longitudinal studies, which can be expensive to carry out. Nevertheless, only collecting quantitative data misses explanations and understanding. It does not offer explanations about "why" the identified problem exists and "how" people perceive and respond to it. This is a strength of qualitative methods which are particularly effective in identifying intangible factors, such as social norms, gender roles, ethnicity and religion, that influence behaviour and choices (Kooijman et al. 2023). A good example of the revelatory value of qualitative methods in the context of gender and energy comes from Feenstra and her colleague's study in the Netherlands referred to above which offers an explanation as to why, despite programmes to encourage girls to take up STEM subjects they appear not to have the expected effect (Feenstra et al. 2022).

It is a positive step that development practice in the context of promoting energy access has moved towards collecting household data disaggregated between female/male headed households. However, it is not far enough. Firstly, women and men are not two homogeneous groups. They differ across a whole range of socio-economic characteristics, such as age, education level and ethnicity. So, their energy choices will differ, possibly also within the same economic group. Data for Germany show that, as of 2021, amongst single-parent households living in income poverty, 84.4% are headed by single mothers and 15.6% by single fathers (Statistisches Bundesamt et al. (2021) cited in Röhr 2021:5). In the UK, in 2015, 16.4% of ethnic minority households were living in fuel poverty compared to 10.4% of white households (EIGE 2017). This point underlines the need for intersectional data with the UK being one of the few countries in the world that collects this type of data.

By using the household head as the only source of data misses intra-household differences. Negotiations between household members about all aspects of family life do not usually take place between equals. In most societies, men have more power than women to make decisions about, and exercise control over, not only their own bodies, lives and resources, but also that of other family members. This decision making also extends to areas considered women's responsibility such as cooking when men will take the decision about purchasing stoves. The point about

who gets to consume what, and who takes what decisions in the household was made by Amatya Sen, the Nobel Prize winning economist, some years ago (Sen 1999). However, it seems to have taken some branches of economics time to accept Sen's point instead preferring to consider the household is a unified entity pooling resources rather than one that combines cooperation and conflict – possibly because the latter does not allow household preferences to be expressed in terms of a single utility function (Elson 2012). The UK, along with a number of other countries, has moved away from collecting household data from the 'household head' to one of 'household reference person'. Since 2001, a person within a household is nominated to act as a reference point for producing further derived data and for characterising a whole household according to characteristics of the chosen reference person[18]. The aim (or should I say 'aspiration'?) is to gain a more comprehensive understanding of all family members perceptions and behaviour.

There is also the tricky question about what constitutes a household (Clancy 2002). The family unit forming a household varies from culture to culture and over time. It can consist of several generations of people connected by marriage or can extend to include people who have no kinship relationship with the family, such as, servants, workers, and paying lodgers. The composition of a household is also fluid for example, adult members (usually male) migrating to find work, which can impact on household income and on gender roles. For example, in Nepal, rural male migration is part of a household strategy to earn income. Women are left to manage the farm, taking decisions about crops and livestock that in the past have been by men which contributes to their personal empowerment and a change in their social status (MSSRF and CRT Nepal 2019).

I would argue that the two approaches of quantitative and qualitative data gathering are complementary and when used in combination provide a powerful tool which can provide the rigour for knowing and acting in such a complex environment as gender and energy. Nevertheless, I would propose that we can go even further by embracing different research methods and fields to give us an even better understanding of the situation

[18] https://www.scotlandscensus.gov.uk/metadata/household-reference-person/ (accessed 5 December 2023).

we are trying to understand and support. For example, much of gender and energy research, in particular at the user level, has tended to be about women and energy. There is very little about men's use of energy – a very good exception (despite what the title might indicate) is the study by IDS and GIZ (2019). Indeed, the invisibility of men has led to the establishment of masculinities as a research area which applies gender analysis to men, examining notions of masculinity within and between societies, also reminding us that men are not a homogeneous group (see for example Pulé and Hultman 2021) nor are they all 'the enemy'. Ethnography helps explain why change with a group does not always happen in the way outsiders anticipate from their intervention (see Matinga 2010). A historical perspective can offer insights about approaches used to introduce consumers to using electricity which had gender variations in roles depending on the location (Matly 2005). Such insights can help areas now tackling this problem to adopt appropriate methods. The Energy Justice Framework is under-utilised particularly in the context of the Global South. It provides a comprehensive analytical tool made even more powerful when viewed through a gender lens.

I would also recommend the use of the concept of the Hard-to-Reach User when addressing the energy transition. It helps move away from seeing insufficient income as the sole barrier to adopting more energy efficient or green forms of energy. There are many more causes such as older people with no smart phone, declining literacy levels, and high incomes. In this context, Behavioural Science can provide insights into what motivates people to respond to policy initiatives and the mechanisms to communicate.

Another way that academic research can support practice is by helping give more attention to theory, for example, the concept of entrepreneurism, particularly in the context of women as energy entrepreneurs could help ensure that efforts to promote this avenue for women's income generation succeed. For example, income levels from selling energy service technologies will depend on the capacity of a community to pay for them which influences the availability of a market for a product, as was found with the solar cookers promoted in the Solar Mama Programme in Rajasthan, India (Mininni 2019).

SOME ADVICE

In this last section I want to finish with some advice particularly to those involved in gender and energy practice and one recommendation for developers of energy technology.

First avoid parity of numbers as a target in an organisation. I do not consider this a measure of gender equality, nor does it bring gender justice that changes goals and ways of working in the energy system. For example, creating interesting and lucrative job opportunities for a group of highly educated women in the energy sector, while it has a positive impact for a small number who will not live in energy poverty now and in retirement, it does not necessarily transform organisational structures and behaviour which conform to masculine norms. Organisational changes requires more than the appointment of a 'gender officer' who is usually a woman. Firstly, it can place too much burden for achieving gender equality only the shoulders of individual women and takes away any responsibility from men. Implicit in the appointment of a woman as the gender office is an assumption of sisterhood. There is no conclusive evidence that women are more likely to represent women's interests then men are (Childs and Krook (2009) cited in O'Neil and Domingo, 2016).

Secondly, having strongly advocated qualitative research, a golden rule should be when analysing results from interviews is to keep in mind: what people say they do and what they actually do are not necessarily the same thing. For example, in the UK when asked about who does the ironing in their household, 76% think it is a shared task, whereas the reality in mixed households is different – in 65% of households the woman irons; in 27% it is a shared equally and in 7% it is the man.

Thirdly, too many decisions are made based on untested assumptions which are presented as universal truths. As I have pointed out above, assumptions about what will happen after improving energy access does not always materialise. For example, if an expected outcome of rural electrification in the Global South is a stimulus to the local economy based on producing innovative, value adding products it cannot be taken as a given. Research in rural Kenya reports that interviewees tended to have a rather limited idea about the types of businesses access to electricity could be used for. The examples respondents gave tended to be for services many of which already existed. A possible explanation is that

there is limited incentive to think 'outside the box' since rural areas do not have excess cash so demand beyond daily necessities is unlikely (Fingleton-Smith 2020).

Finally, I want to return to the book that first caught my attention as a young student, Schumacher's 'Small is Beautiful' to which I would adjust the sub-heading to read 'technology as though people matter'. My own experience has shown that you can have a piece of technology that either generates or uses renewable energy which you think solves a problem, however, the reality can be very different when you don't take people into account. A good example, which I have used in my lectures to engineering students, is the solar cooker which is a technology designed by male engineers from the Global North with good intentions to make life better in the Global South. It is a technology which ticks several boxes: it is low-cost, provides a clean alternative to fuelwood, so no pollution and saves women's time. However, using a solar cooker requires cooking in the full heat of equatorial noon outside the house. For those houses without a flat roof, where it might be possible to safely leave the stove, the cook, usually a woman, must constantly monitor the stove to ensure that neither it nor the pot is stollen. Monitoring the stove ensures that the food isn't tampered with, nor your neighbours can see what you are cooking and making judgements about you as a wife and mother. Indeed, one of the few project evaluations that has been carried out more than 6 months after the project officially finished found that very few solar cookers were still in use as cookers but had found a more acceptable use by the householders as mirrors (GTZ 1999). When I was at Reading and more involved in the hardware aspects of technology development, I was given a piece of advice by an engineer who had spent many years working in rural Colombia trying, through the application of appropriate technology to find solutions to the problems of rural peoples' lives. I have tried to apply that advice throughout my working life to avoid the 'solar cooker syndrome'. I have ended many of my lectures to young engineers with his words: be reality led not technology driven. I cannot think of a better closing statement!

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The academic tradition when writing a document includes a section with acknowledgement of people who have indirectly contributed to the writing of the document, so I decided to include a section in my Farewell Address. I have been involved in academia for many years which has involved many friends, colleagues and students. Unfortunately, I cannot include everyone by name – so my apologies if you don't find your name here – that doesn't mean you were less important or didn't make any significant contribution – far from it. Rest assured, if our paths have crossed you will have had an influence on the direction my path took.

When I first joined Reading University, my only trip to the Global South had been a holiday in Mexico. So, I was not ideally placed to develop energy solutions for situations where I had no idea what daily life involved for people shaped by their history and cultural practices. It was therefore very astute of Professor Peter Dunn to send me to spend time in Papua New Guinea at the University of Lae under the guidance of Richard Burton in whose house I learned to live with cockroaches, a love of the BBC World Service (this was in the days before the internet) and to touch type. I also had one of those unexpected encounters where someone from one part of your life appears in another part – Ernest Milner, who I grew up living next door to, was working at the University (he also resurfaced again during a visit to Botswana). I enjoyed many happy hours in the Milner household during my stay in PNG.

If you are on a long trip from home, it can be quite lonely particularly in the days before the internet, and I have always been very fortunate that I have been invited into the homes of many kind people around the world who have not only entertained me but also contributed to my understanding of the way the world turns. My partner Giles Stacey has joined me on a number of occasions. I have made several visits to Tanzania, including a wonderful 4 month stay, during which I was taken under the wings of the families Kawamba and Kimambo who were understanding, although sometimes bemused, about mzungu behaviour (eg actually being pleased there's a power cut – so I can see the night sky), as well as the Sowdens with whom I passed several enjoyable weekends in Arusha. I want to thank

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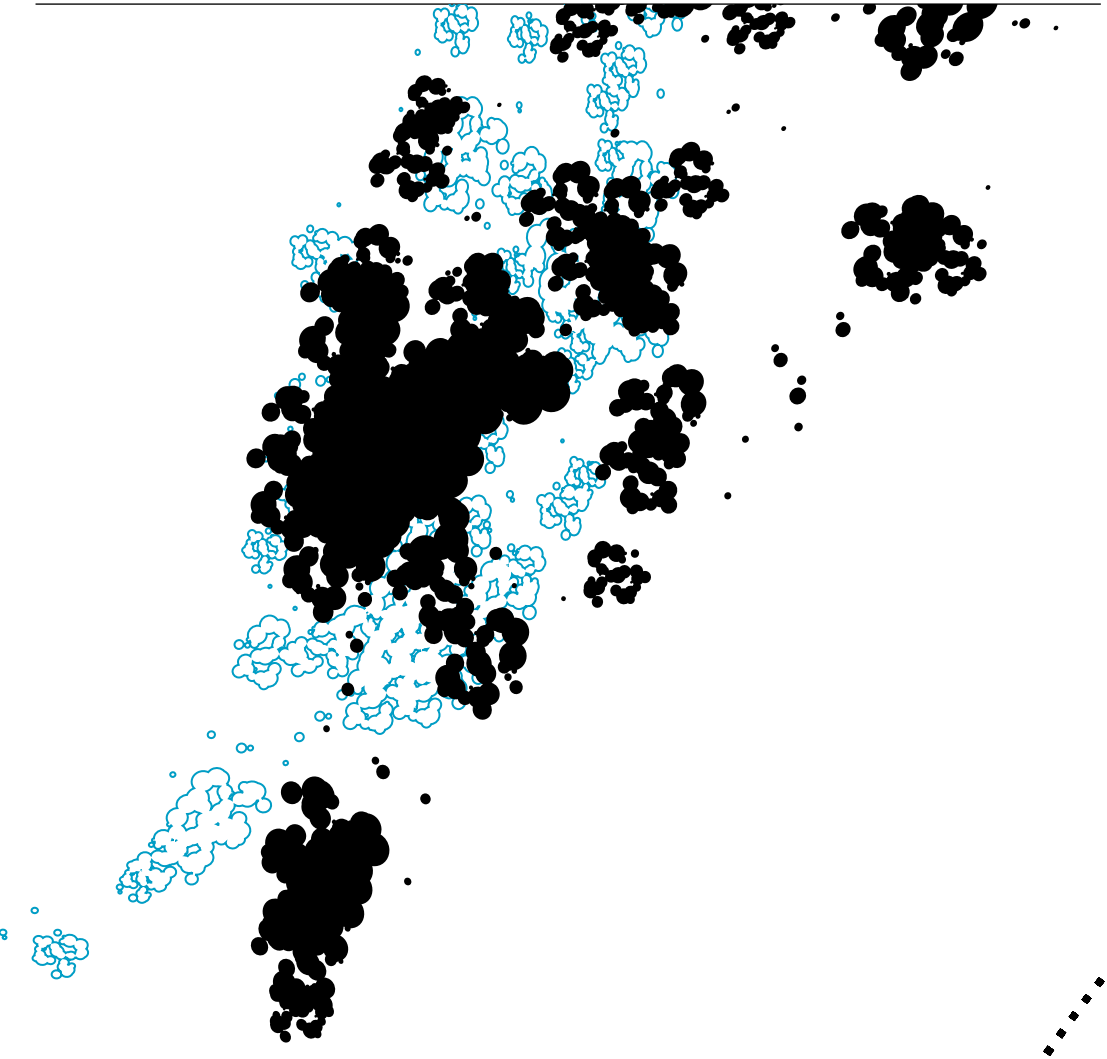
My Farewell Address is dedicated to my cousin and fellow Evertonian Sean Tanzey (1962-2024)

Nil satis nisi optimum



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