



Women in Engineering – France

Greater diversity for more innovation



**Claire
LAJOIE-MAZENC**

What did you study and what are your sources of motivation or inspiration?

For as long as I can remember, I have always loved maths, books, nature and sport.

Although in my younger days I hesitated between maths teacher, bookseller and engineer, my love of science in the broadest sense and my curiosity led me to choosing an engineering path in my teenage years, without really knowing what that meant, nor that there were very few women in this field. I was very sociable, but I wasn't afraid of solitude, so being in the minority in a class was not something that worried me at all.

This naïveté continued into my preparatory year, when the haphazard nature of university competitions and my fascination with automatic systems (I did not know what they were, but I was curious to find out) led me to a degree in electro-technical-automation at ENSEEIHT, an engineering school for electrical engineering, electronics, computer science, hydraulics and telecommunications.

The three years that I spent doing that absolutely convinced me that I preferred more "abstract" subjects (maths, automatic systems, industrial IT, etc.) to practical work in machine rooms. Maybe it was something to do with some of the misogynistic teachers who were less than gentle with the very few girls in my year. And I don't think I showed any interest or any exceptional ability in these areas.

I then followed my boyfriend (who has since become my husband☺) to Brazil, where I found a research position at the Federal University of Santa Catarina, with the control and micro-computing laboratory. It was there that I discovered artificial intelligence and I got the opportunity to follow the very first course that the university put on (back in 1987). I also discovered, thanks to a book in EDF's "Graphs and Algorithms" R&D collection, that EDF was engaged in things that were more interesting (for me, at that time) than the world of retail, that I had experienced through my father's job.

How and why did you get involved in energy?

When I returned to France in 1988, and after a first job in IT that was not conclusive, I was quickly able to join my boyfriend at EDF's R&D division, where they were looking for someone who knew a little bit about artificial intelligence in order to develop an expert system for helping commercial engineers advise their clients about power supplies for industrial processes.

Because there was a lack of projects, I gradually moved away from AI and got closer to energy: optimising the power supplies for plasma torches and plasma fuel burners, then reliability studies for substations and then prospective studies for developing the substations of the future.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

It was through this project that tackled the prospective regulatory and institutional as well as the technological aspects that I was asked to join a task force for the Substation Study Committee in 1994. It was a tremendous opportunity, but at the same time extremely overwhelming, since I got the feeling (and in fact, it was more than just a feeling) that I did not know anything and did not have much to contribute to the group, which had four other people in it, all of whom were significantly older and more experienced than me (in addition to the fact that I was the only woman). But they were extremely welcoming, and although I learned more than I contributed, I was still able – through my "new eyes" and probably my more theoretical approach – to get them thinking about issues to do with reliability and broaden their outlook beyond purely technological considerations.

I learned a great deal and got some very useful information for my project, but the experience also gave me the motivation I needed to leave the R&D division to go and explore the rest of the company, and – like my TF friends – gain a better understanding of the way in which the facilities were operated and the associated difficulties.

Although I never got to work on the projects run by the International Council on Large Electric Systems' Design Committee again, the experience ended up having a major influence on the rest of my career.

What's more, I've never stopped being a member of the International Council on Large Electric Systems, and whenever I can, I attend the Paris Conference so I can keep up-to-date with technical, academic and industrial developments.

As a woman working in the energy sector, how do you view the path you have taken today?

Although working as an engineer really was more of a vocation, I ended up in the energy sector through a random series of events.

A kind of naïveté that I've probably never lost helped me to avoid focusing on the fact that there weren't many women working in that particular field, and even fewer in the operations and managerial posts that I was lucky enough to have. And I've rarely felt that being a woman really was an obstacle.

I actually experienced it as an opportunity to do these jobs differently, since there weren't many models to copy. It's a type of freedom that is precious to me and is a major factor in my commitment to Women in Engineering today. It isn't about fighting for rights, because I don't feel as though I am feminist deep down and I certainly don't want to pitch one category (women) against another (men). Most of all, I think it's a fantastic opportunity for men, who are also changing, to free themselves from "patriarchal manager" models which are powerful and sometimes overbearing.

And a wonderful opportunity for our companies to speed up the evolution that is needed today.



**Fadila
AZDIA-BAMBA**

What did you study and what are your sources of motivation or inspiration?

Initially, my studies weren't focused on engineering or technical professions. I was always interested in foreign languages and knowing about other cultures. Because my results in modern languages at school were very good, I developed a real love of overseas travel.

So after a baccalaureate that focused on economics and social studies, I decided to study applied foreign languages (English and Spanish) at the University of Lyon II. I hadn't yet decided what I wanted to do for a living. My university degree kept my options open for a wide range of areas. So I didn't feel as though I was stuck on a particular career path and I gave myself a little time to decide on what I wanted to do.

After two years at university, I seized the opportunity to study in the UK. And I got my bachelor's degree from the University of Portsmouth as part of the Erasmus overseas study programme. The year I spent abroad only confirmed my desire to work in an international environment later on. I also realised that if a company wanted to survive, it had to sell overseas, and I gained an awareness of how important intercultural considerations were for successful export operations.

So when I got back to France, I decided to focus on a business career and I chose a specialist option in International Business when I did my Master's degree.

How and why did you get involved in energy?

When I finished studying, my first job as an export sales rep in the IT sector gave me experience in developing client portfolios and managing negotiations in an international environment.

Then, my business and language expertise – and a little good luck – led me to the world of the electrical energy transformation. I got a job with a manufacturer of power transformers, as a France and Export Sales Manager, in a sector where there was a preponderance of people from a technical background and very few women. I successfully took up the challenge and managed to integrate – thanks partly to my motivation and my internal training, but mainly thanks to highly-qualified people who shared their expertise in a range of different areas with me.

I then became genuinely interested in this sector that was particularly active in France, as well as overseas. I found out about a very varied range of applications through the equipment installed in factories, electricity power plants, trains and ships.

What also encouraged me and made me realise that there was a role for me in this job was that there was a need for multidisciplinary expertise – particularly in project management, where honouring contractual commitments, cost control and risk management involve more than just technical expertise.

I joined the ABB Group in 2012 as head of sales for France and the Benelux countries, tasked with growing sales across the whole portfolio (special transformers) for one of the Group's factories in Lugano. I was based in France, and I was the only woman in a sales team of around ten people. Another woman has since joined the team (in Lugano).

For several months now, I have had a "global" role, overseeing strategic initiatives. And it's the first time that a woman has been my manager!

With hindsight, this rather atypical path has benefited me – it has helped me get to grips with my various roles in different ways.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I discovered the International Council on Large Electric Systems several years ago as an exhibitor – it's a major event for companies in the energy sector.

It's a forum in which we can meet our clients and decision-makers in the electricity industry from several countries, as well as an opportunity to find out about the latest trends, innovations and developments.

As a woman working in the energy sector, how do you view the path you have taken today?

When I take stock of my career, I don't really get the feeling that I ever encountered any insurmountable obstacles, and I don't think that being a woman – and a non-engineer, what's more – was ever a hindrance. The secret is that people trusted me. A team's diversity is what enhances it for the company.

I have had a number of different roles, which meant that I have been able to tackle different tasks, work in different places and in different ways. Admittedly, as a mother of two children, I have had to be extremely well organised to balance my personal and my professional life. I have also been fortunate insofar as I have been able to count on grandparents' help on a day-to-day basis. I am very proud to be able to show my children that barriers can be overcome. Although there are still more men than women working in the energy sector, more and more women are finding jobs in it.

As far as I'm concerned, having not encountered any brakes internally, I think that unconsciously, one can turn one's back on certain technical jobs because of certain biases – biases that I have never really encountered over the course of my career.

I am also proud to be part of a company which is striving for equal opportunities. One of the things that ABB has done is sign a company-level agreement to implement a concrete action plan designed to increase the number of women in certain technical or sales positions, as well as increasing the number of men in a number of support roles.

I am not currently planning on leaving the energy sector. I have gained a great deal from it and it still fascinates me, with new challenges for our society to embrace, such as the energy transition or digitisation.



**Magali
KOCHANNEK**

What did you study and what are your sources of motivation or inspiration?

The path I took with my education was relatively conventional: after school, my interest in science led me to a preparatory course and then a degree in engineering.

But it was my interest in learning, my desire to understand "how things work" which guided me throughout my studies and then when I started to work. And that curiosity still informs me choices today.

How and why did you get involved in energy?

The years that I spent studying engineering at Supélec (an electrical engineering institute) naturally led me to focus on the energy sector – in the broadest sense – and that was how I started working for EDF.

What I enjoy most of all is being able to continue learning and working on new subjects: that's most likely why research suits me so much.

I have been able to find out about several energy-related fields: I started working on electromagnetic compatibility at the start of my career, and then moved over to electricity applications in buildings and industry. I have worked on energy issues for local authorities, local electricity consumption and production of electricity for one's own use, on the improvement of energy efficiency and on the energy transition in cities... occupying a number of different roles ranging from ones that required technical expertise to project management.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I discovered the International Council on Large Electric Systems more than 20 years ago when I started working at EDF's R&D division!

My first job with the Electrical Engineering Laboratories involved investigating the effects of electromagnetic fields – on EDF infrastructure and electricity applications, as well as on the living world.

I was dropped in at the deep end and had to give an address at the International Council on Large Electric Systems conference in Paris the year after I was hired.

Back then, I was also involved in standardisation groups where I met the same people as on the International Council on Large Electric Systems. From my perspective as a 23-year-old,

there were lots of suits and people with grey hair... and very few women! But all of the specialists I met were kind and always ready to share their experience with me.

As a woman working in the energy sector, how do you view the path you have taken today?

Being a woman in this job sometimes means feeling a little alone – like when you realise that you are the only woman alongside fifty or so other people...

Since I was always in the minority in science areas, and all the more so in energy (barely 10% of the people on my engineering course were girls back then...), I ended up getting used to it and I stopped noticing.

And then finally, when I found myself in a slightly different field (in my case, energy efficiency) where the percentage of women is higher, I really noticed that having a good balance between men and women is a strength, and that collectively, we would all benefit if things could be like that in all fields!



Marie-Paule DAYER

What did you study and what are your sources of motivation or inspiration?

I was raised with dolls... as well as building bricks and Allen keys and soldering irons: my playgrounds were rather varied!

The general education I had did not really cover all of the subjects which piqued my curiosity. Indeed, it is difficult in our education system to reconcile an interest in foreign languages and sociology with disciplines such as mechanics and physics! So once I had completed my basic general technical education, I decided to go to an international business school.

After that, it was all a question of the choices I made and who I met.

With hindsight, I'd say that the path I took was influenced by my taste for discovering new things and challenges... and definitely a little intuition.

How and why did you get involved in energy?

You encounter energy in so many different guises! After working in fluid mechanics and then physical measurements, I got involved in the world of electrons at ABB.

Electricity is essential to everything we do, and as such, it should be made available as a fundamental resource to people.

I hope to be able to make my own personal contribution to rolling out partnerships and establishing exchanges so that more people have access to energy, but with less of a global impact.

What's more, the power mix touches on economic, environmental and geopolitical considerations... making it very appealing for me!

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

The International Council on Large Electric Systems is a major international organisation for many of my ABB colleagues.

For the first time this year, I have been invited to a Women in Engineering meeting organised by the International Council on Large Electric Systems, and I'm looking forward to taking part.

I'm sure it will be inspiring to find out about the women and men who – in their own way – promote diversity, which is a vital part of the creative process and essential for ensuring quality.

As a woman working in the energy sector, how do you view the path you have taken today?

I couldn't say if our ways of thinking really are different, but they often complement the ways in which our male colleagues and clients think.

Just as bringing different cultures together makes people question things, diversity within a group is a way of changing rules that have sometimes been around for too long! Nowadays, this is an acknowledged way of facilitating the emergence of innovative models and co-developing projects.

We still have to support this momentum, among young people in particular.

I am hoping to get my daughter and my son to understand that the best vocations in life are the ones that inspire us, and I am sure that, together, we will smile at the old-fashioned situations that I have come across!



**Maud
FRANCHET**

What did you study and what are your sources of motivation or inspiration?

My education was relatively conventional: a preparatory course for physics and chemistry, and then I studied engineering. When I left school, I wanted to do chemistry. But once I was on the preparatory course, I found a new passion: electromagnetism. So my new aim became getting into Supélec (an electrical engineering institute). Things worked out well: not only did I get into the engineering institute of my choice, but I was then able to do a radiocommunications option in my final year.

As fate would have it, while I was mainly studying signal propagation, the effect of magnetic fields and antennae design, I was offered a traineeship with the French Atomic Energy Commission, which admittedly had a link to wave propagation in cables, but which was very different from what I had envisaged at the outset – i.e. the effects of magnetic fields on the living environment and equipment. Why did I accept? Most likely the fact that this traineeship could lead to a PhD and the fact that I immediately got on well with the person who presented it to me. And that was the start of an eight and a half year adventure in the world of cable diagnostics. Indeed, not only did I do this traineeship, but I continued investigating this field as part of my PhD (still with the French Atomic Energy Commission), and was ultimately hired by EDF's R&D division, where the first work I did was in this area.

I never asked myself too many questions about my career and training choices – at least not while I was studying engineering. My career has resulted from meetings and opportunities, and has mainly been guided by my desire to learn and engage in science.

How and why did you get involved in energy?

The answer is quite simple. When I was in the final year of my PhD, I started looking for a job, and I went to the Centrale Supélec forum and left copies of my CV there. Soon after, I was contacted by Thalès and EDF. Both offered me jobs, both with very different technical content, but equally interesting. In the end, what tipped the scales was simply how I felt during the job interviews. And I have no regrets. I am fortunate enough to be able to work confidently with my colleagues – which is not necessarily the case in all companies.

Now, I have a permanent position with EDF's R&D division and I work on cables and cable link accessories. I also perform a few electromagnetic simulations. I have moved away from my specialist area somewhat, but at the same time, I have discovered a new field and learned some new things.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I discovered the International Council on Large Electric Systems when I arrived at EDF. I was part of a working group that has just completed its task and I am now in a new group which was formed this year.

What has it done for me? In my opinion, it's an extremely rich experience, particularly for a young engineer/researcher – it's an opportunity to rub shoulders with people who have a great deal of experience in their field.

What's more, practices can differ from one country to another, and it's always interesting to see how things are done elsewhere. It affords you an insight into the outside world.

What's more, the contacts that you make within the framework of the International Council on Large Electric Systems can be very useful when you are stuck on a technical issue. You can quickly find a solution to your problem.

As a woman working in the energy sector, how do you view the path you have taken today?

I'm not really a feminist.

Since my preparatory course, I have been working in a male environment.

I don't get the feeling that being a woman has ever been an obstacle. Some of my teachers were a little chauvinistic – in their marking in particular. But when they were, my way of dealing with it was always to prove that they were wrong.

I work in a department where women engineers and technicians really are a minority.

If you wanted to feminise it a little, you have to start by increasing the number of young women on electrotechnical courses and technical degrees.

I think that there are more and more women across the International Council on Large Electric Systems.

There are three of us in my group, including the convener, which is a good sign.

Despite everything, it's still a little strange to be the only woman at a table surrounded by mostly men, most of whom have a great deal more experience in their field. Sometimes, some of them adopt a slightly paternalistic attitude towards me.

As a general rule – and this isn't specific to the world of energy – I think that one of the difficulties for female engineers is speaking up in a meeting with mostly men in it, without getting interrupted.



**Nathalie
Hoarau**

What inspired you to study Electrical Engineering?

I studied physics at university and then specialised with a postgraduate diploma in energy systems. I then did a PhD in materials science and engineering at Mines ParisTech.

My main areas of interest were modern physics – particularly thermodynamics, electromagnetism and quantum physics. I loved the fact that uncertainty could rule the world and that we were surrounded by waves, carrying light and information everywhere.

The dynamics of energy in thermodynamic systems, its interactions and the transformations it undergoes are fascinating.

These dynamic and uncertain representations of the world were much closer to my vision of life – that is never still and full of surprises – than traditional mechanics or optics.

Physics is also about dealing with priorities – you have to decide on the main phenomenon that you want to deal with if you want to find a solution to your problem.

Basically, physics is all about life!

How and why did you start working in Energy?

I started working in the energy sector last year after more than 15 years working in various jobs in aeronautics.

For me, the energy transition is the new frontier of our society, and I wanted to be part of it.

I've been hired by General Electric to work as a Technology Quality Leader for Grid Solutions.

Did I know a lot about their technologies? No. Did I know a lot about quality? Enough to adapt.

This new challenge in my professional life re-energised me.

I discovered a new organisation, new people, new areas of expertise and new rules. What a field to explore!

I am now deploying methods and tools to help our technical project leaders make our new product even more robust and reliable than before.

A good framework to allow creativity in a structured way.

How did you discover the International Council on Large Electric Systems? What have you learned from it?

I attended my first International Council on Large Electric Systems conference in 2018. It was an opportunity to learn about the players on the market quickly and efficiently simply by visiting their booths and asking them questions.

My colleagues introduced me to a number of events, they explained the new technical challenges facing us and the need for standards if we are to deliver safe products.

I'm still learning – I still have a lot to learn to become a good member of society.

How do you see this path today, as a woman in the World of Energy?

I believe that women have the same capabilities as men, but traditionally, they have played a different role in society and in private life. I see my path mainly as a personal adventure, with specific aspects to it that my gender gives it. In Europe, equality is the rule. But there is still a great deal to do in changing the way in which patterns of work are structured and in adapting people's mindsets before women can be both professionals and women with a fair career development path. It's just as true in the energy sector as it is anywhere else.

Women working is still a relatively new phenomenon and our education and a number of prejudices keep young women away from careers in technology.

I have seen how people behave in some companies... I have sometimes been my own worst enemy, self-censoring my ambitions and keeping my opinions to myself.

We have a legitimate role to play as women... as human beings... in any industry.



**Séverine
LAURENT**

What did you study and what are your sources of motivation or inspiration?

In terms of inspiration and motivation, I would say most definitely one of my grandmothers! She wasn't at all conventional and was extremely whimsical. And what's more, something which was quite rare back then, since she would be over a hundred today: she always worked (working gave her independence and fed her spiritually). That made me want to study and work in areas away from the beaten track: archaeologist, space explorer, director, screenwriter, etc. But like many people, I was extremely lazy during my teenage years and became somewhat more conformist. So I took the more traditional, easy path – the one people take when they don't know exactly what they want to do. I did a scientific baccalaureate and then studied engineering. I had no particular vocation!

I got into French engineering school ENSEEIHT on the least specialist course: Applied information technology and mathematics. Another strategy to avoid specialising too much. Fortunately, I liked applied maths, so much so that I tried to extend my student life by doing a PhD in the area. But because I had a bad feeling about my future PhD supervisor, I backed out and instead took up a job offer from EDF working in research & development. I told myself that it would be a good compromise.

Do I have any regrets about having chosen this path? Yes, two. First of all, I regret not having tried courses that were more enriching than the subjects taught at engineering school, and I regret not having had a year out before I started working – just to do something completely different abroad somewhere. I just got onto the treadmill too quickly.

How and why did you get involved in energy?

It was pretty much by chance when I was working on power grids. And I allowed myself to get caught in the trap – I became more and more interested in the topic over time in the various positions that I occupied and then when I joined RTE, France's electricity transmission system operator. First of all, a genuine interest in the technical and economic issues associated with expanding the electricity grid, then opening it up in the general interest and how to reconcile that with society's other needs.

A job as "key account manager" (in my case, serving as an intermediary between the client and my company's various different departments, each one with expectations in relation to the other account, given the high level of technical interaction between the two companies) was an opportunity to discover new, less technical aspects, but ones that were extremely enriching: negotiations conducted within the framework of a "built to last" relationship, so by looking for compromises that were acceptable by both parties, drafting contracts – which required good technical knowledge of problems so that potentially high-risk situations could be resolved. And then for this role as an intermediary – which is not frequently found in

professional contexts – you need to be interested in the other party – their needs, interests, their stumbling blocks, etc. and ask yourself questions – so that the work can go smoothly. It's fascinating, difficult but gratifying – and useful in everyday life.

Now we have a new topic: climate change and the action we need to take in order to address it. This involves incorporating renewable energies into the power mix, as well as implementing eco-design initiatives into RTE's processes and expanding its network. An interesting challenge!

In an area that is ostensibly technical, we can find out about issues that are more connected to our time... and ones that are also more enriching.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I took part in a software demonstration when I had just been hired, nothing else since! Recently, we had to give new impetus to the work being done by one of the study committees run by the International Council on Large Electric Systems that we had abandoned. And since it was a field with which I'm familiar and of which I am fond, I was put forward to be the French representative.

The issues involved? Have an opportunity to look into other areas at a time when situations are highly changeable, different from country to country, together with major technological changes. Sharing these trends and experiences via the International Council on Large Electric Systems means more creativity.

As a woman working in the energy sector, how do you view the path you have taken today?

Over the last few years, there have been some profound changes in the energy sector: questions are being asked about the "all nuclear" approach, energy efficiency has become a major topic and we are seeing a boom in renewable energies, which are calling our old "centralised" systems into question. These changes, which are technical or technological first and foremost, actually go beyond this single consideration. They mean that these fields are no longer the exclusive domain of high-calibre specialists who were previously alone in having the right answers to questions. Questions which shouldn't be asked, what's more. In my opinion, this societal change is a huge opportunity for people who work in these areas: new ways of doing things are now possible! And being a woman working in these areas is just one more little difference...

As far as the profession is concerned – or rather the job of engineer – maybe there is a trend – particularly in a company like RTE, where the vast majority of people are... sort of united in the way they think through the training they have had. And a slight mistrust in relation to certain issues or approaches which are different, and so are not "scientific" or technical, and so which are quickly discarded or put to one side. The lack of diversity – in the broadest sense – is what encourages this uniform way of thinking: and just by being a woman, we can disrupt this. And that's something positive! I think the time has come for us to be more than just a thorn in people's sides. Don't hesitate to acquire university or cultural experience in social or human sciences (which is what I did not do, unfortunately): being different until the very end!



**Sylvie
COURTY**

What did you study and what are your sources of motivation or inspiration?

I loved maths right from a very young age. In nursery school, I loved adding up... and then from primary school right up until when I left, I would spend my summers buying exercise books so I could solve problems that weren't on the syllabus. I would spend my holidays camping, and it was then that I was lucky enough to meet a France Télécom engineer, with whom I had a number of highly interesting discussions about maths and how maths could be applied in a corporate environment. But because I wanted to be a maths teacher, I did a preparatory course at the Parc *lycée* in Lyon. And when I was signing up for the competitive exam, I wanted to keep my options as open as possible, so I focused my attention on engineering schools.

My results were good enough for me to get into ENSTA (an advanced engineering institute) or SUPELEC (electrical engineering institute), so I chose SUPELEC, because I was interested in electricity.

How and why did you get involved in energy?

When I finished at SUPELEC, I didn't just want to be stuck in a design office until I was promoted to design office manager. I wanted to do something more concrete, so I got involved in electricity distribution in the operations department, where I was immediately placed in a managerial role.

The public service values that the EDF group adheres to also confirmed that I had made the right choice. I wanted to teach so I could play a part in education and serve society. EDF plays a part in serving people living in France. Electricity is a basic need.

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I only got involved with the International Council on Large Electric Systems through the intercompany Women in Engineering meeting. I was lucky enough to be asked by Annie Kirche, a member of the International Council on Large Electric Systems group, to take part in a round-table discussion about diversity in companies.

But I come from a technical background: operations, general studies, engineering, electricity technical department and now Director of the Studies & Development Division of the Mobility Programme.

The opportunity to take part in the International Council on Large Electric Systems did not present itself.

As a woman working in the energy sector, how do you view the path you have taken today?

In fact, studying engineering opens up huge numbers of career possibilities; I have had some highly technical jobs: I have run an IT programme in management accountancy, I have had strategic marketing roles in supply quality and cogeneration, I have been head of a gas distribution plant and head of an Enedis region. So studying engineering really is a passport to being able to create one's own career based on one's aspirations.

Because I'm a woman, I had to be careful not to trap myself in functional roles; my desire to take on increasingly high-level managerial responsibilities and my network within the group helped me a great deal.

And as a director, I have always been in favour of diversity – not just between men and women, but also in the educational or professional paths that people have taken. It's one of the things that drives performance in a team.

I have encouraged the inclusion of women in technical teams in the West Ile de France regional department, because they have a great deal to contribute through the different approach that they offer, particularly when it comes to works safety.

So I did not think twice before saying yes to Annie Kirche when she asked me to get involved in Women in Engineering and to Laurent Karsenti, who is a member of the Women in Engineering group set up by the International Council on Large Electric Systems, when he asked me to share my thoughts.



**Vanessa
BISCONTI-CATEAU**

What did you study and what are your sources of motivation or inspiration?

When you decide on your career path, you choose a discipline and a business sector.

As a business school graduate, I quickly started looking at corporate strategy and B2B marketing. After a first job in retail, I decided to move into the industrial sector. The challenges facing industry, the opportunities and its dynamic nature all informed my decision to focus on this area.

I quickly realised that there were two languages in industry: marketing/financial/sales... and engineer. Having been brought up bilingually, it's impossible for me not to understand all of my colleagues! I therefore did a master's degree in energy management, as part of a partnership provided by the Grenoble Management School with ENSE3. That provided me with the basics of energy engineering and gave me what I needed to talk about megawatts with my colleagues!

How and why did you get involved in energy?

I chose energy for two reasons: dynamics and meaning!

The business school courses provide access to an incredibly wide range of activities and sectors. You become the preferred target of audit and consultancy firms, as well as major multinational retailers, consumer goods manufacturers and major luxury item companies! Every year, these companies hire numerous students from business schools.

But once I had chatted with young product managers from these fields, I had major problems knowing what exactly my role and my personal contribution would be. It's probably a generational malaise, but I am one of those people who attach a great deal of importance to finding meaning in what we do. Let's be realistic, marketing involves showcasing a product as effectively as possible with one single purpose: getting people to buy it! I need to know that I am making a contribution, even if it's only on a very small scale, through the organisation for which I'm working, to something greater! When I see the experiments being conducted by the Solar Impulse Foundation, Brütten, ABB Formula E, etc. and the rewards from Fortune 500 recognising ABB among the companies that contribute most to innovation serving the energy transition, I get the feeling that I have contributed something of which I am proud!

Playing a part in the future of sustainable and connected mobility, the future of clean, distributed and smart energy, the future of the connected, less energy-guzzling home... or helping to bring about a more modern, effective and competitive digital industry... Energy is something that drives all sectors and is undergoing an unprecedented transformation. Every day, there are technical innovations in this sector. Consideration is given to the way in which

we will use energy in the future, and its business models are forever being reinvented... So basically, the energy sector will never be seen as an ageing field!

How did you find out about the International Council on Large Electric Systems? How has it benefited you?

I discovered the International Council on Large Electric Systems through the contributions of my ABB colleagues who are involved in working groups, as well as through a major event that it organises every two years in Paris.

I was also invited to a Women in Engineering meeting organised by the International Council on Large Electric Systems last year, and I got to see just how high-quality the discussions there were, and how impressive the women were who had come to represent what they do in the energy sector.

Unfortunately, there are still too few of these inspirational women and we all need to do our bit to tackle the problem at its source: we need to present this sector to very young schoolchildren and to women in particular! I strongly believe in dusting off the image of women in industry, regardless of their career path, and the International Council on Large Electric Systems is helping with this initiative!

As a woman working in the energy sector, how do you view the path you have taken today?

Curiosity and diversity are riches that need to be cultivated!

I give a lot of credit to the diversity of the educational paths that people follow: engineering schools/business schools.

My team is made up of young engineers and young marketing specialists. What they all have in common is their methods and capacity to understand and analyse. For everything else, they complement one another, and each person is able to cast a critical and well-intentioned eye over what their colleagues are doing. Ultimately, it is this diversity that provides a complete and sophisticated solution!

Similarly, I am also absolutely certain that more gender diversity will increase the effectiveness of teams! It ensures a wealth of different points of view and organisational models sometimes end up being optimised!

I like to think that when a woman has children, she becomes a fully-fledged SME manager who has to manage numerous timetables, a budget and several work streams, all at once!

Different people's profiles complementing one another is what makes a team strong and varied. And given all the challenges and opportunities to be embraced in the energy sector, these contributions are welcome!



**Vera
SILVA**

What inspired you to study electrical engineering?

I grew up in a small town in Portugal. Our electricity was generated by the local dam and there were sometimes outages that would last for hours. But then in the late 1970s, the town was connected to an electrical grid and the blackouts stopped. Our lives were changed in the flick of a switch. This made me curious about how electricity actually worked. What made the lights stay on?

One day, I visited a hydroelectric power plant. I was fascinated by how it all worked, how we turned moving water into electricity by the sheer magic of physics and clever engineering.

I carry that passion with me to this day. It hasn't always been easy. In high school, I chose electricity and electronics, and I was the only girl in the class. But my team won the Physics Olympics in Portugal, and it showed me that I could do anything. Like earning a Master's Degree and a PhD in electrical and electronic engineering and going on to a career in this exciting and essential field.

"My team won the Physics Olympics in Portugal, and it showed me that I could do anything".

What excited you about working in the energy field?

What I love about my job is that every single problem I've been given to solve has felt like it was the most interesting problem in the world at that specific moment in time. At university, it was the telecoms boom, but I was still curious about power systems.

And then the electricity market was liberalised and smart meters came along at the same time, then everybody started talking about data and then renewables, so it was just the best place to be.

The system was always changing and I couldn't wait for the next challenge. I found it in data science, distributed generation and energy storage.

Then, I thought to myself, in about ten years, the most challenging things will be happening at system level, so I moved onto the large scale integration of renewables. I am curious to see where it goes next.

How did you discover the International Council on Large Electric Systems? What have you learned from it?

I have always been active in professional associations such as IEEE, IET, SEE and the International Council on Large Electric Systems. I joined the International Council on Large Electric Systems in 2007 as a member of a Working group (C6) on demand-side integration. This was an exceptional opportunity to learn from leading world experts in industry and academia. My involvement with the International Council on Large Electric Systems was reinforced by my involvement on the Steering Committee of the CIGRE UK Next Generation

network in 2008. This was an excellent initiative supporting the integration of young members into the association. I worked with the International Council on Large Electric Systems to promote the integration of young members to its working groups and develop a mentoring scheme. The pioneering International Council on Large Electric Systems UK initiative has been a great success and expanded to many countries across the globe. My involvement continues with participation in working groups on electrical vehicles, large scale RES integration and with regular participation in International Council on Large Electric Systems sessions. The International Council on Large Electric Systems helped me to develop my technical expertise and create solid professional contacts essential to my career.

How do you see the path of women in the energy business?

Today, more than ever, I believe that engineering is one of the key areas in which we need to have expertise if we are to succeed in developing a sustainable energy future. A future where everyone will have access to electricity, and where renewable resources will be critical in mitigating the effects of climate change and we will have cleaner transport. Successfully bringing about this transition will require the involvement of passionate people and it would be a shame to miss out on the contribution of women.

What can be scary, and certainly made the start of my career hard, is arriving in a world of mostly men. I was the only one who had to leave to pick up her daughter from school and forever excuse myself when meetings took place late in the day.

“Women should not avoid engineering because they think that it won’t be compatible with having a family. It’s not true.”

This has changed. Today, regardless of the teams I’ve worked in, there is an overall consciousness about balancing work and private life. Women should not avoid engineering because they think that it won’t be compatible with having a family. It’s not true. In my 20-year career, I have worked in three different countries and have enjoyed my experiences as an academic and industrial researcher in Portugal, the UK and France; I have had leadership positions as research programme director at Electricité de France and served as Chief Technology Officer with GE Grid Solutions, one of the leading electricity system technology providers.

What’s essential is diversity in decision-making. That includes people of different ages, backgrounds and cultures – male or female. My experience has been that when we look at problems from different perspectives, we come up with better solutions.

“What’s essential is diversity in decision-making... People of different ages, backgrounds and cultures – male or female... we come up with better solutions.”

Bringing more young women into STEM careers will only increase that diversity. Girls need to know they have options and opportunities. We all need to encourage young talent, wherever it appears.

After all, this is a very important and increasingly open field. What used to be about electricity, magnetism and electro-mechanics, is now about everything: digital, data information and communication. It will involve many different types of knowledge and many different stakeholders.

It really is a field where you can pursue so many different passions and still find your place.

