

Your future after the MSc Industrial Ecology



Universiteit
Leiden
The Netherlands

 TU Delft

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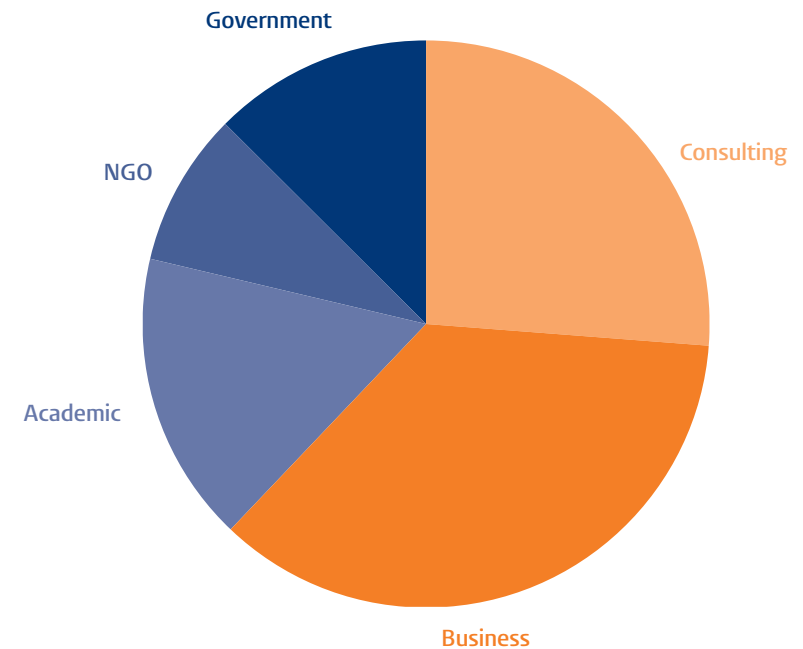
Industrial Ecology is an emerging scientific discipline that takes a systemic approach to sustainability problems. An interdisciplinary approach, integrating engineering, environmental and social science perspectives, is essential for sustainable development. Our students also call Industrial Ecology the ‘science of sustainability’.

Skills and knowledge

After graduating you are an Industrial Ecologist. As an Industrial Ecologist you will have a thorough understanding of how society’s metabolism contributes to and is influenced by current societal and sustainability challenges. You will be trained in methods and tools for analysing physical and social processes. You will also be able to apply tools and theories from multiple disciplines to critically evaluate sustainability issues from a systems perspective. You have hands-on academic experience from conducting a thesis research project, but also valuable practical experience from completing two Industrial Ecology case study projects. The combination of academic skills, systems thinking and hands-on experience with Industrial Ecology tools and methods makes you attractive for employers.

Career

An analyst or researcher in a company such as TNO, a policy advisor for a governmental institution, or an engineer working for an energy company. One can find graduates from Industrial Ecology in the entire breadth of the sustainability field. There are graduates who choose a scientific career at a University, starting as a PhD student. Most graduates, however, have jobs outside academia, for example as sustainability advisor or consultant at a company, organisation or municipality. Some graduates also become entrepreneurs and create a start-up to further work on ideas they have developed during one of the projects conducted for Industrial Ecology.



Interviews with alumni

The stories of the Industrial Ecology alumni in this booklet show the diversity of career possibilities after Industrial Ecology. We hope their stories inspire you to think about how you can apply your IE degree!

- Pieter van Exter
- Franco Donati
- Janneke Pors
- Margot Möslinger
- Leonardo Gonçalo Melo



Pieter van Exter

*MSc Industrial Ecology 2015 – 2017
Consultant & Team Lead - Metabolic
Before starting IE:
BSc Future Planet Studies*

Can you tell us a bit about your BSc background and why you decided to study Industrial Ecology?

I already knew that I wanted to contribute to sustainability, so I chose Future Planet Studies, an interdisciplinary bachelor programme at the University of Amsterdam. At that time, you had to choose a specialization and I went for business studies because I really wanted to understand the languages that businesses

were speaking. Because for me, they are holding the key in the transition towards a more sustainable future.

I had heard about Industrial Ecology (IE) via my cousin, who was already studying it and who was very enthusiastic about it. The idea of the programme really matched with my search for tools to help quantify and assess sustainability. I was really happy with my

choice, with the atmosphere, going to two universities, to really dive into a lot of super and interesting things. I really liked that the programme is solutions oriented and that you really got access to the tools.

And during your MSc, did you already know what you wanted to do afterwards?

I didn't know exactly what I wanted to do, but I really liked the practical application of IE. So I quite soon knew that I didn't wanted to do a PhD. There is a side of me that is really into the science and research side, but I would really miss the practical oriented focus. But I was not so sure about becoming a consultant either. However, during the progress of graduation, I applied for a position at Metabolic, a company that I already knew and had followed for quite some time.

So, and you now work at Metabolic!

Yes, I was hired as a consultant, which I still am, but now I'm also team lead. I really like to get things done and moving, so I'm very happy with my position here. At Metabolic, we are applying systems thinking, different tools such as material flow analysis, life cycle thinking – so tools related to systems thinking - on companies, cities, regions in Europe, but also in the USA and Singapore to help them transition to a more 'circular economy'. In our definition, this circular economy is holistic and includes social and environmental impact and goals.

At Metabolic we have specialists and generalists, such as Industrial Ecologists, we have a design team, that is proving us with the visuals and such, which is a very important part of communicating our message and making it easier for people to act upon, and we have a data science team, that is able to deal with large chunks of data.

What kind of projects do you have and what does your typical day look like?

It really depends, but generally you work at two or three projects at the same time. You are partly in the office, partly out of the office meeting clients, giving presentations, doing acquisition. Typical projects are around six to seven months.

We are working with all sorts of companies and cities that are on different steps of the transition. So we work with these really leading companies – for which we are for example exploring how science based targets would look like for other systems then carbon, such as water and nutrient flows. So those projects are very explorative: we are developing new methodologies and so really defining new space. But we also work with companies that are just starting to think about sustainability.

What is your favorite project thus far?

The project that I'd started with was a vision and strategy for circular Rotterdam. I am still very proud of that project because it was my first and because it has been really adopted by the municipality. But also a project that I've done for the Dutch Custodial Institutions Agency (DJI), where we looked at the impact of prisons, was really interesting. We have published our recommendations in February 2019 and we are really seeing the first results of our work, which are quite significant.

The success of our work really depends on the quality of work you deliver and also on making sure that the client is able to take it forward. If you keep those two key things in mind, I am convinced that you can have much more impact than working for an individual organization.



“I think the value of IE cannot be underestimated”

What did you learn at IE that you are still applying in your work?

Apart from of course systems thinking and methods tools, I think this whole narrative of using nature as an example and a source of inspiration, so the analogy for following material flows, the impact of these flows, the stakeholders that are related to it, how to bend flows (for example industrial symbiosis), that is a major part of the work that we are doing.

I think the value of IE cannot be underestimated. Systems thinking is quite new for companies and governments, but people are starting to really see the value of that kind of thinking. I think that it is sometimes difficult to value the skills that you are taught during IE, but I advise students to not underestimate those skills. IE might stay abstract and you might sometimes have the feeling that you might not go deep enough,

but I think you get this feeling with every interdisciplinary programme. But then again, you shouldn't forget how important it is that you are able to connect different sides with each other. Especially with the topic of sustainability, which is so interconnected with our whole society. We really need to understand this whole system and spectrum to make change happen.

The importance of IE today is that everyone, companies, cities, etc., seems to be moving in a sustainable direction, or at least they claim to be. It is therefore crucial that we now consider all perspectives, and take a holistic broader perspective, otherwise there is the threat of taking the wrong decisions.



Franco Donati

Industrial Ecology 2014-2017
PhD student at Leiden University
Before IE:
BSc Industrial design

Why did you decide to study Industrial Ecology?

I was already interested in the field of Industrial Ecology (IE) during my bachelor and the holistic approach to industry and sustainability. I learned about LCA and I thought it was an effective tool to guide sustainable design.


I see the ecological crisis as the greatest threat and challenge humanity has ever faced. These feelings were strengthened by what had happened in my birth region, Sardinia, in 2013, when the cyclone Cleopatra had struck across the island killing 18 people, displacing 3 thousand people from their homes, destroying infrastructures and businesses and causing 1 billion euros of damage. After this event, I was even more persuaded that I needed to get a formal education in sustainability that would allow me to actively support the transition to sustainability.

What are you doing at the moment and is this linked with IE?

I am currently doing a PhD funded by the European Union through the EIT Raw Materials KIC. The objective of the research project was to develop an online platform and courses for analyzing and modelling raw material supply chains. The other part of my research is focused on how simulation tools and artificial intelligence techniques can be used to obtain information on the impacts of products' life cycle.

What would you advise current IE students?

I would advise students to learn how to code and to get the most out of the IE programme by always trying to see connections between what you are learning and what makes you excited.



“I would advise students to make use of the opportunities that come with studying IE.”



“We have a lot to offer to organisations.”



Janneke Pors

MSc Industrial Ecology 2005 -2008
Senior advisor Circular Economy at Port of Rotterdam
Before (and during) IE:
Doctorate (BA and MA) in Dutch Language and culture
Work experience in the financial sector as a policy advisor

Why did you decide to study Industrial Ecology after already completing a complete programme?

I was already working in the financial sector, but I was always drawn to social and environmental topics. So, I started looking for a programme related to that and found Industrial Ecology (IE). The concept of IE was for me very appealing, learning from nature and trying to create cycles. And the fact that it is offered by two universities and has a multi-disciplinary approach.

What did you like about studying IE?

The whole idea of the programme, to work towards sustainable solutions, is the most appealing part to me. I also really liked getting to know an entirely new field, which made it also an intellectual challenge. Also, the teachers of the programme were really approachable and there was a really good and international atmosphere. What was also nice, was that I was able to combine my two studies during my thesis, for which I worked on the concept of framing. I tried to introduce framing analyses

and tools to the field of IE. I think this is very relevant, because when you work on sustainable solutions, you have to deal with a lot of stakeholders, and the way you present and frame the solution is really important. Are you going to frame it as a risk policy, as a market opportunity, or moral obligation? The framing will affect company strategies.

During your MSc, did you already know what you wanted to do afterwards?

During IE, I made the switch to the sustainability sector. It was nice being able to use the things that I had learned at IE in finding a new job. I did an internship and got a job at a sustainability consultancy agency. This agency was focused on regional development, creating stakeholder dialogues and enabling economic developments. For example, I worked on the reuse of oil and gas platforms and I looked at an industrial cluster in Terneuzen, to research what the circular economy perspective could mean for them.

What does your function at The Port of Rotterdam entail?

I am working for the Environmental Management department, as a circular economy advisor. My core task is to see how we can enable companies that we work with, to become more circular. For instance, by trying to create the right policy conditions and space for experimentation. If we really want to shift from primary industries using raw materials, to secondary industries, we need significant changes in policy, financing and company strategies. Therefore, I'm currently developing a

strategic circular economy scenario and have worked, among others, together with two IE professors (dr. Arjan de Koning and dr. Ester van der Voet) on this. Also, within The Port of Rotterdam, we have a decarbonisation strategy to become a decarbonized industrial cluster by 2050. There are different programmes, for example on renewable energy, biobased development, hydrogen, energy efficiency and circular economy.

What did you learn at IE, that you are still applying in your work?

My background in IE, having knowledge about tools such as LCA, how to calculate carbon footprints, etc., is very helpful. In policy development, for instance, the rules for specific developments are often focused on how much CO2 reduction should be achieved and where in the supply chain. How this is calculated and what factors are included is a very political discussion.

What are your recommendations for current IE students?

Environmental implications are key from a business perspective. Nowadays opportunities for business development are really depending on the environmental performance of products and processes. If you have expertise on that, it is a really good basis. However, I think it is important for students to not position themselves too much as environmental specialists. Their expertise can be applied very broadly and is very valuable. A 'tip' would be, to make sure you have a broad background. We have a lot to offer to organisations.



Margot Möslinger

MSc Industrial Ecology 2017-2019

Junior Professional at the European Commission

Before studying IE:

BA German Philology & BA American Studies

MA International Relations and European-Asian Studies
(including a BSc Minor in Sustainable Development)

Why did you decide to study Industrial Ecology after already having done a MA?

I was interested in doing Industrial Ecology (IE), because I wanted to get a more scientific perspective on climate change and sustainability. During my bachelor and my previous master, I missed natural science courses and was taken aback by the fact that in my international relations programme, not once did the topic of climate change come up, even though this is one of the arguably most severe and most complex issues when it comes to international relations in our century.

The ability to combine my knowledge on politics, and my strengths in the natural sciences, as well as my strong wish to tackle climate change, made me choose this programme. I was eager to find out more about the things we as a society, as researchers, but also as individuals can do.

What does your function at the European Commission entail?

I first started at the European Commission doing the so-called Blue Book traineeship of the Joint Research Centre of the European Commission. After my traineeship, I was selected for the 2.5 years long rotational

Junior Professional programme at the European Commission. This programme is closely linked to my IE thesis research project on the development of a sustainable Circular Economy (CE) business model and set of indicators to measure CE in the food and beverage industry, which I did during a research internship in a technology transfer project with technology of the European Space Agency. So currently I get to work on technology transfer and eco-innovation, especially on green technology transfer, which is becoming more and more relevant with the New Green Deal as well as on space policy (and sustainability-related aspects) and on the Circular Electronics Initiative at the Directorate-General for Communication Networks, Content and Technology. For all these different projects I am involved in, I am able to apply the knowledge I learned in Industrial Ecology, highlight the relevance of sustainability, and help reach the objectives of the Green Deal.



“Make use of the wide pool of accessible specialization courses of the two universities and try to learn as much as possible!”

What would you advise current IE students?

Make use of the wide pool of accessible specialization courses of the two universities and try to learn as much as possible! I would also advise students to get some practical experience during their MSc, in the form of an internship, volunteer work, joining the EIT Climate-KIC Master label programme, etc. This helps you to think about what to specialize in and what kind of career you would like to pursue.



Leonardo Gonçalo Melo

*MSc Industrial Ecology 2017 – 2019
Junior sustainability consultant at TNO, Netherlands*

Before starting IE:

*BSc and MSc Mechanical engineering
6 years of working experience*

Why did you decide to study Industrial Ecology after already having done a MSc?

I decided to study Industrial Ecology (IE) because I wanted to know more about sustainability in a broader sense, so apart from only the technical aspects. I have always been very inclined to politics and strategy and I think that is the reason why I am happier at my current job in comparison with my previous jobs. At TNO, the focus on sustainability is not only technical, we are also working on future policies.

What did you like about the study programme?

I especially liked the opportunity to really find your niche through choosing your own specialization courses. My favorite course was Environmental Input-Output Analysis (EIOA), because I'm very much interested in the intersection between environment and economics. I believe that a lot of the environmental problems we now face, are because of our economic behavior and that if we are able to nudge people in the right direction, a lot of these problems might be solved.

While studying, did you already know what you wanted to do afterwards?

I knew I wanted to end up working on sustainability policy, but only after a couple of years of working experience. When I was doing EIOA, I came across TNO a lot, since they helped create the EXIOBASE database. I contacted TNO to do my thesis research project as an intern there and afterwards was able to work for them.

What does your function at TNO entail?

I'm a sustainability consultant and I use hybrid methods while doing sustainability assessments, working at the intersection between EIOA and Life Cycle Assessment (LCA). Furthermore, I'm currently working on two long term projects concerning decarbonisation in industry.

What did you learn at IE, that you are still applying in your work?

Of course being able to apply IE methods, such as LCA and EIOA. And during one of my specialization courses at TU Delft, on recycling engineering, I learned a lot about critical raw material assessment, which is very helpful.

What would you advise current IE students?

I would advise IE students to write their thesis at an organization or company, for example at TNO. This way, you already get to know a company and they get to know you. And for international students who want to work in the Netherlands after graduation: learn Dutch! You can do Dutch language courses at TU Delft or Leiden University.

Contact info

Science Career Service Leiden University

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- ✉ career@science.leidenuniv.nl

Career Centre TU Delft

- 🌐 www.tudelft.nl/en/student/counselling/managing-your-career
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