

Course Guide

Greening the Economy: Sustainable Cities

A Massive Open Online Course



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<http://www.coursera.org/learn/gte-sustainable-cities>

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THE INTERNATIONAL INSTITUTE FOR
INDUSTRIAL ENVIRONMENTAL ECONOMICS



About this Course

How can we shape our urban development towards sustainable and prosperous futures?

This course explores sustainable cities as engines for greening the economy in Europe and around the world. We place cities in the context of sustainable urban transformation and climate change. We connect the key trends of urbanization, decarbonisation and sustainability. We examine how visions, experiments and innovations can transform urban areas. And we look at practices (what is happening in cities at present) and opportunities (what are the possibilities for cities going forwards into the future).

This course was launched in January 2016, and updated in September 2021 with new podcasts, films and publications. The course is produced by Lund University in cooperation with WWF and ICLEI – Local Governments for Sustainability who work with creating sustainable cities. The course features researchers, practitioners and entrepreneurs from a range of organisations.

The course has four overall objectives:

- Increased knowledge on sustainable cities.
- Improved critical thinking on the opportunities and challenges for sustainable cities as engines for greening the economy.
- Deeper understanding of the relationship between urbanization, decarbonisation and sustainability.
- Expanded ability to use systems thinking to assess sustainable cities.

The course is structured around 5 modules with a total of 27 short films, 5 podcasts and 10 key readings. Read about the different types and combinations of films and materials below.

Lectures: Presentations on the key themes of transformation, infrastructure and planning, governance and experimenting, lifestyles and visions for sustainable cities.

Cases: A collection of projects and initiatives on sustainable cities are presented and explored.

Examples: Insights into how to reduce climate and environmental impacts from housing, transport, lifestyles, food and consumption in cities.

Documentary: The documentary “The Urban Green” provides a glimpse into the opportunities and challenges for creating sustainable cities.

Podcasts: The podcasts make connections between cities and missions, nature, labs, consumption and design. The podcasts involve a combination of interviews and critical discussions on cutting-edge research and real-life stories.

Module 1 – Urban Transformation

The expected learning outcomes for this module are increased knowledge and a deeper understanding of urban transformation and sustainable cities.

Study activities in this module:

- Watch the short films in Module 1
- Read the course literature for this module:
 - Advancing Sustainable Urban Transformation [Download](#)
 - ICLEI Green Climate Cities Overview [Download](#)
- Listen to the podcast as inspiration
- Engage in forum discussions
- Take Quiz 1

#	Film Title	In this film you will learn about:	Presenters/ Producers
1L1	Sustainable Urban Transformation	...why cities are strategically important to sustainable development, climate change and greening the economy. The concept of sustainable urban transformation is presented as a foundation for understanding urban change processes.	Kes McCormick
1L2	Sustainable Cities	...the concept of sustainable cities and how cities can become more sustainable, resilient and prosperous through key activities on energy, mobility and buildings.	James Evans
1L3	ICLEI Green Climate Cities – an introduction	...an introduction to an international program on green climate cities.	ICLEI
1L4	ICLEI Green Climate Cities – development strategy	...an overview of a development strategy for green climate cities.	ICLEI
1L5	WWF Housing	...how the housing sector can reduce climate and environmental impacts. The film is focused on examples from Sweden and developed by WWF.	WWF
1L6	WWF Urban Green	...the Urban Green – part 1.	WWF
1P1	Podcast	...a podcast on cities and missions.	IIIEE

Module 2 – Urban Infrastructure

The expected learning outcomes for this module are increased knowledge and a deeper understanding of the role of urban infrastructure and planning in creating sustainable cities.

Study activities in this module:

- Watch the short films in Module 2
- Read the course literature for this module:
 - Taking Action for Urban Nature: Innovation Pathways Handbook [Download](#)
 - NATURVAION Brief [Download](#)
- Listen to the podcast as inspiration
- Engage in forum discussions
- Take Quiz 2

#	Film Title	In this film you will learn about:	Presenters/ Producers
2L1	Infrastructure and Planning	...the role of urban infrastructure and planning in creating sustainable cities and greening the economy. The challenges and opportunities related to transport and mobility in cities are presented.	Kes McCormick
2L2	Cities, Nature and Innovation – an introduction	...an introduction to a research project on cities, nature and innovation.	NATURVAION Project
2L3	Cities, Nature and Innovation – international overview	...an international overview of cities, nature and innovation from around the world.	NATURVAION Project
2L4	WWF Transport	...how the transport sector can reduce climate and environmental impacts. The film is focused on examples from Sweden and developed by WWF.	WWF
2L5	WWF Urban Green	...the Urban Green – part 2.	WWF
2P1	Podcast	...a podcast on cities and nature.	IIIEE

Module 3 – Urban Experimentation

The expected learning outcomes for this module are increased knowledge and a deeper understanding of urban living labs and the role of experiments in sustainable cities.

Study activities in this module:

- Watch the short films in Module 3
- Read the course literature for this module:
 - The Emerging Landscape of Urban Living Labs: Characteristics, Practices and Examples [Download](#)
 - GUST Brief [Download](#)
- Listen to the podcast as inspiration
- Engage in forum discussions
- Take Quiz 3

#	Film Title	In this film you will learn about:	Presenters/ Producers
3L1	Climate Governance and Urban Experiments	...climate governance and the role of cities in responding to climate change. Examples are presented on international collaboration between local governments and urban experiments on decarbonisation.	Harriet Bulkeley
3L2	Governance of Urban Sustainability Transitions – an introduction	...an introduction to a research project on the governance of urban sustainability transitions.	GUST Project
3L3	Governance of Urban Sustainability Transitions – discussions themes	...a review of discussion themes on urban living labs and experimentation in cities from around the world.	GUST Project
3L4	WWF Positive	...how climate positive solutions can reduce climate and environmental impacts. The film is focused on examples from Sweden and developed by WWF.	WWF
3L5	WWF Urban Green	...the Urban Green – part 3.	WWF
3P1	Podcast	...a podcast on cities and labs.	IIIEE

Module 4 – Urban Lifestyles

The expected learning outcomes for this module are increased knowledge and a deeper understanding of the relationship between urban lifestyles and sustainable cities.

Study activities in this module:

- Watch the short films in Module 4
- Read the course literature for this module:
 - Sharing Cities: Exploring the Emerging Landscape of Sharing Economy in Cities [Download](#)
 - Sharing Cities Sweden Brief [Download](#)
- Listen to the podcast as inspiration
- Engage in forum discussions
- Take Quiz 4

#	Film Title	In this film you will learn about:	Presenters/ Producers
4L1	Sustainable Urban Lifestyles	...how local governments can influence urban lifestyles and the creation of sustainable cities.	Jennifer Lenhart
4L2	Sharing Economy and Cities – an introduction	...an introduction to a research project on the sharing economy in cities.	Sharing Cities Sweden Project
4L3	Sharing Economy and Cities – key topics	...a review of key topics for the sharing economy in cities from around the world.	Sharing Cities Sweden Project
4L4	WWF Consumption	...how changing consumption can reduce climate and environmental impacts. The film is focused on examples from Sweden and developed by WWF.	WWF
4L5	WWF Urban Green	...the Urban Green – part 5.	WWF
4P1	Podcast	...a podcast on cities and consumption.	IIIEE

Module 5 – Urban Visions

The expected learning outcomes for this module are increased knowledge and a deeper understanding of visions for sustainable cities.

Study activities in this module:

- Watch the short films in Module 5
- Read the course literature for this module:
 - Smart and Sustainable Cities? Pipedreams, Practicalities and Possibilities [Download](#)
 - WWF One Planet City Challenge Overview [Download](#)
- Listen to the podcast as inspiration
- Engage in forum discussions
- Take Quiz 5

#	Film Title	In this film you will learn about:	Presenters/ Producers
5L1	Visioning Cities for the Future	...how visioning processes can shape policies and plans for sustainable cities. Visions can mobilize individuals and organisations to change the direction of urban development.	Lena Neij
5L2	WWF and Sustainable Cities	...why WWF is engaging with cities and the importance of reducing carbon footprints through changing urban infrastructure and lifestyles.	Carina Borgström-Hansson
5L3	Smart and Sustainable Cities – an introduction	...an introduction to an innovation program on smart and sustainable cities.	Viable Cities Project
5L4	Smart and Sustainable Cities – future possibilities	...a review of future possibilities for smart and sustainable cities.	Viable Cities Project
5L5	WWF Food	...how changing eating habits and food procurement can reduce climate and environmental impacts. The film is focused on examples from Sweden and developed by WWF.	WWF
5L6	WWF Urban Green	...the Urban Green – part 4.	WWF
5P1	Podcast	...a podcast on cities and design.	IIIEE

Course Assignment: Green Urban Initiatives

In this assignment we want you to focus on a green urban initiative (implemented, ongoing, planned or proposed) in your city or a nearby city. The green urban initiative should be aiming to improve your city in response to climate change and/or environmental impacts. Make sure to use what you have learned in the course as regards to visions, innovations and experiments.

For inspiration have a look at the websites of ICLEI – Local Governments for Sustainability (www.iclei.org) and WWF (www.panda.org) where you will be able to find examples of green urban initiatives in cities from around the world. You can also find some example submissions developed by the course teachers.

The assignment consists of three parts.

Part 1. Describe an environmental/climate problem that you are concerned about in your city or a nearby city of your choice (it can be a problem generated by your city or affecting your city). For example, air pollution from congested traffic in the city. Why do you find that this problem is relevant in your selected city? What are the impacts of the problem on your city and its citizens? To begin your assignment you can look at the website of the city government in your selected city.

Part 2. Present and analyse a green urban initiative by the city government (or collaboration of stakeholders) to respond to the environmental/climate problem. For example, investments to develop integrated public transportation. Can you describe the green urban initiative and its effects on your city? How is the green urban initiative working to improve your city? If your city lacks a green urban initiative responding to the environmental/climate problem you have identified, then present and analyse the limited response.

Part 3. Suggest improvements to inspire further action on the environmental/climate problem. For example, develop a mobile phone app for the city that gathers real-time data on the quickest and easiest routes to increase the use of public transportation. Can you suggest improvements to the green urban initiative you have identified in your city? What new activities or innovations could be needed to promote transformative change in your city?

Present your assignment using the following format (maximum credits for each part is indicated within brackets):

- Summary – Write a 1-2 sentence summary that reflects your assignment on a green urban initiative. Try to grab attention and present a key message. (4)
- Parts – Describe part 1, 2 and 3 as presented above. Each part should be at least 50 words and not exceed 150 words. (10 + 10 + 10)
- Share & Illustrate – Add a pin in the city of your choice to the course map and provide an image (or other illustration) capturing the issue you have focused on in a visual way. Add your summary as well. (6)
- Resources – i) explain how you have used the films and/or readings from the course to support your assignment and ii) list any other references (not from the course, for example hyperlinks) you have used to present the selected city, its problems, initiatives and suggested improvements. (6 + 4)

Optional/bonus (not graded but appreciated):

- Make a tweet or post on social media about your assignment on a green urban initiative in your city (remember @lunduniversity @coursera @IIIEElund @kesmccormick)



It is important that you select issues and material that you find relevant for your assignment, that you justify why you have selected them and find them relevant, and that all parts of the assignment is presented in a clear, logical way. Submit your assignment before the soft deadline to allow enough time for your peers to review your work.

In this assignment you are not only submitting your own work, you also take on the role as a reviewer, grading the work of three other course participants. Please allow yourself sufficient time for these reviews, so that you can give your peers a good, fair and justified assessment of their work.

When evaluating assignments by others, you will be asked to look at both relevance and clarity of the different submission parts. Try to be both objective and open minded in your evaluation and grading. When asked to give comments and feedback (appreciated but not graded) be nice, polite and provide brief, constructive critique.

Example 1

Title: Urban Forest Strategy in Melbourne

Summary: A healthy urban forest will play a critical role in maintaining the liveability of Melbourne in the face of a changing climate.

Part 1: The City of Melbourne is facing the significant challenges of climate change, population growth and urban heating, placing pressure on the built fabric, services and people of the city. The increasing heat in the city associated with climate change is a major concern for the city government as it poses health risks for people in the city. At the same time, parks and gardens as they have been designed in the past are insufficient to help "cool" the city. And in fact, many trees and plants in the city are under stress from heat and limited water. So the whole strategy around a green and liveable city needs to be transformed.

Part 2: The City of Melbourne has developed an Urban Forest Strategy that seeks to protect against future vulnerability by providing a robust strategic framework for the evolution and longevity of the urban forest in Melbourne. The strategy aims to adapt the city to climate change, mitigate the urban heat island effect by bringing the inner-city temperatures down, create healthier ecosystems, become a water-sensitive city, and engage and involve the community.

Part 3: The urban forest strategy in Melbourne is impressive. An improvement could be to connect the growing of more trees and plants in the city to also increase the biodiversity. Increased biodiversity is a way of improving resilience of the urban forest as the climate is changing. A further step forwards could be to benchmark the strategy against the best in the world, and aim to be the world leader on developing an urban forest in the City of Melbourne. Business in the city could also be engaged to invest in planting trees.

Share & Illustrate: A green pin with a picture and short description has been added in Melbourne, Australia on the Course map.

Resources: The main resources used from the course, included the films in module 1 on urban transformation and module 2 on urban infrastructure. A key reading used was the Taking Action for Urban Nature: Innovation Pathways Handbook [Download](#)

Example 2

Title: Biogas Buses in Malmö

Summary: From fork to wheels - fuelling your rides with waste from your kitchen

Part 1: Traffic volumes are high in Malmö and a number of larger transit roads cross the inner city. Traffic is responsible for most of the air pollution in Malmö. Even though the air quality has improved over the years and is now rated as "good", and sulfur dioxide and nitrogen dioxide levels are relatively low, air pollution still poses a significant health risk for Malmö residents. In fact, the number of deaths associated with air pollution is said to be higher than those from car accidents. Transport also leads to climate change and noise.

Part 2: The municipality-owned waste company has together with the City of Malmö invested in buses fuelled by biogas in the last decades. By now, all 200 buses in Malmö run on a mixture of biogas and compressed natural gas. As compared to conventional buses that often run on diesel, this enables reductions of GHG emissions, NOx emissions and particles. Moreover, Malmö is now investing in new buses using hybrid technology – a motor running on biogas generates electricity powering a number of electric motors that drive the bus. Batteries are used as intermediate energy storage. By using this technology, the buses generate even lower emissions.

Part 3: As the buses use batteries, which are charged with biogas-fueled electricity, the batteries could also be charged with electricity from the grid. A further development of the technology would be to use so-called plug-in hybrid buses, where part of the energy could come from charging the batteries with electricity during the time they go back to the bus depot, often at night. Depending on the potentially limited supply of biogas, the City of Malmö could also extend its biogas-driven charging stations for private electrical cars with special "fueling" stations also in suburbs to allow for a stronger incentive and use of biogas-fueled electrical cars. It would also give individuals the choice to have a greener version of electrical cars.

Share & Illustrate: A red pin with a picture and short description has been placed in Malmö, Sweden on the Course map.

Resources: The main resources used from the course, included the films in module 2 on urban infrastructure and module 5 on urban visions. A key reading used was the Advancing Sustainable Urban Transformation [Download](#)

Course Grading

How do I pass the course?

The course activities that are graded in this course are the 5 quizzes and a peer assessed assignment. Only these 2 activities are graded, meaning that you do not get credits for (or are graded on) viewing the course videos, looking over the readings, or participating in forum discussions. However, by doing these activities we are convinced that you will learn a lot and will be more prepared to do the graded activities!

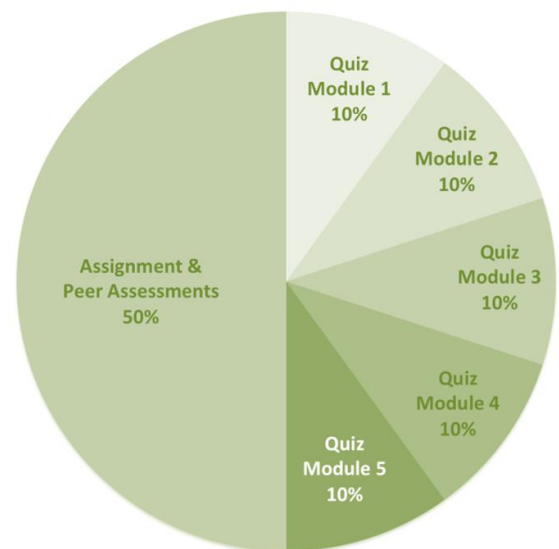
The quizzes

Your final grade is determined by your score on 5 equally-weighted quizzes, with each quiz worth 10% of the final grade. When you take a quiz, you get a number of credits (your score) depending on how well you do in the test. Each credit you earn in the course represent 1%.

You can get maximum 50 credits by completing the 5 quizzes successfully. Consequently, the quizzes constitute in total 50% of the grade.

In each quiz you must get at least 80% of the total score in order to pass. You have 2 hours to complete the quiz, and if you do fail your attempt, you can re-take the quiz 2 more times within this time period. If you do not succeed within these 2 hours, after 8 hours you will get a new 2 hours timeslot to make new attempts.

Once you have completed a successful attempt, the score you get in this attempt is the result being graded. If you score 80% on the quiz, you have passed the threshold and you add 8 credits (out of maximum 10) to your final grade.



The assignment

The assignment consists of a) your submission and b) your peer review of 3 assignments by your peers. You must complete b) in order to obtain credits for a). You can get a maximum of 50 credits for completing the peer-assessed assignment.

By completing the peer assessment part of the assignments, you are not only helping your fellow students, but you also help yourself completing the course. Completing more than 3 reviews is highly appreciated, but you will not earn any more credits.

What is the pass rate for the course?

You must do and pass all the graded activities in order to pass the course. There is an 80% threshold for passing each of the quizzes, and a 60% threshold for passing the peer assessed assignment, so the overall pass-rate of the course becomes 70%. Once you have completed and passed both of the graded course activities, you have passed the course.

How can I get a course certificate?

In this course, you can register for a Course Certificate issued jointly by Coursera and Lund University. In order to get a certificate you need to i) verify your identity when doing the quizzes and the assignment, ii) pay a fee to Coursera (or apply for financial aid), and iii) complete and successfully pass all graded activities in the course. Once you have completed the course, you will be informed by Coursera how you can access your course certificate. It is Coursera who administrates the course certificates and it is not within the authority of the course administrators to influence this process.



Course Readings

The course involves 10 key readings, which underpin the short films. The knowledge from the readings complements the short films.

Remember to also check out Chapter 4 on Sustainable Cities and Chapter 1 on Greening the Economy in the compendium entitled Greening the Economy: Lessons from Scandinavia. [Download](#)

Module 1: Urban Transformation

- Advancing Sustainable Urban Transformation [Download](#)
- ICLEI Green Climate Cities Overview [Download](#)

Module 2: Urban Infrastructure

- Taking Action for Urban Nature: Innovation Pathways Handbook [Download](#)
- NATURVATION Brief [Download](#)

Module 3: Urban Experimentation

- The Emerging Landscape of Urban Living Labs: Characteristics, Practices and Examples [Download](#)
- GUST Brief [Download](#)

Module 4: Urban Lifestyles

- Sharing Cities: Exploring the Emerging Landscape of Sharing Economy in Cities [Download](#)
- Sharing Cities Sweden Brief [Download](#)

Module 5: Urban Visions

- Smart and Sustainable Cities? Pipedreams, Practicalities and Possibilities [Download](#)
- WWF One Planet City Challenge Overview [Download](#)

Course Teachers and Staff

In the short films in this MOOC you will meet 6 main teachers from a mix of organisations. The combination of teachers is designed to enhance your learning experience in the course by providing a diversity of perspectives. You will meet the teachers across the 5 modules in the course.



Dr. Kes McCormick
Associate Professor, IIIEE,
Lund University



Prof. Harriet Bulkeley
Professor, Durham
University



Prof. James Evans
Professor, Manchester
University



Dr. Jennifer Lenhart
Expert, Sustainable Cities,
WWF



Prof. Lena Neij
Professor, IIIEE, Lund
University



Dr. Carina Borgström-Hansson
Expert, Ecological
Footprint, WWF

In addition to the teachers in this MOOC, you will interact with 2 course developers and pedagogues who are working to help make your experience in the course as fruitful and interesting as possible. Furthermore, there are multiple community teaching assistants that support the discussion forums and activities in the MOOC.



Dr. Peter Arnfalk
Associate Professor, IIIEE,
Lund University



Dr. Charlotte Leire
University Adjunct, IIIEE,
Lund University

Further Courses at the City Futures Academy

The City Futures Academy is an online learning community on cities, sustainability, governance and innovation bringing together teachers and organisations from around the world to share knowledge and understanding on urban transformations.

The City Futures Academy offers vibrant Massive Open Online Courses (MOOCs) that combine a diversity of films, podcasts, interactive forums, practical assignments, peer review, key readings and course compendiums. The MOOCs are available for free to everyone and everywhere.

[Greening the Economy: Sustainable Cities](#)

How can we shape urban development towards sustainable and prosperous futures?

[Urban Nature: Connecting Cities, Sustainability and Innovations](#)

How can nature help us design and build our cities?

[Cities and Consumption: Urban Sustainability and the Sharing Economy](#)

How can we govern consumption and the sharing economy in our cities?



About the IIIEE and Lund University

International Institute for Industrial Environmental Economics (IIIEE)

The International Institute for Industrial Environmental Economics (IIIEE) at Lund University in Sweden is an international centre of excellence on strategies for sustainable solutions. The IIIEE is ideally suited to understand and explain the interdisciplinary issues in greening the economy utilising the diverse disciplinary backgrounds of its international staff. The IIIEE has been researching and teaching on sustainability and greening the economy since the 1990s and it has extensive international networks connecting with a variety of organizations.

In 1995, the IIIEE launched its unique Masters Programme in Environmental Policy and Management (EMP) to educate professionals committed to and capable of solving global sustainability challenges. In 2005, the IIIEE joined a consortium to launch the Erasmus Mundus Masters Course in Environmental Sciences, Policy and Management (MESPOM). MESPOM is delivered in cooperation with 3 European and 2 North American universities. More than 1000 graduates of these programmes from over 100 nations are contributing to sustainable development in industry, government, UN organisations, NGOs, SMEs and academia.

The IIIEE has extensive experience with online education both on undergraduate and graduate levels and it has received the E-xcellence label by the EADTU. The IIIEE education is interdisciplinary and it has a close engagement with real-life practice in the private and public sectors. The international character of our Masters education and our outstanding Alumni Network has supported intense learning across national boundaries. The IIIEE has designed and developed a range of MOOCs on greening the economy.

Lund University

Lund University is located in the south of Sweden, in the city of Lund. It was founded in 1666 and it has almost 50,000 students and 7,500 staff. It is ranked in the top 100 universities in the world. Lund University provides education and research in engineering, science, law, social sciences, economics, medicine, humanities, theology, fine art, music and drama. It has initiated MOOCs on greening the economy, sustainable cities, business law and global health.

Greening the Economy: Sustainable Cities is a Massive Open Online Course designed and developed by the International Institute for Industrial Environmental Economics (IIIEE) at Lund University in Sweden in collaboration with WWF and ICLEI – Local Governments for Sustainability

