

Background

About SGO2500 – North/South Development: Energy transitions

This course provides a geographical and critical perspective to global development, with a focus on energy transition processes in and in relation to the global South. The course aims to provide students with a fundamental understanding of the challenges related to sustainable development from the perspective of the global South by focusing on energy transitions.

In light of climate change and the need to divest from fossil energies, energy transitions are at the heart of global development and sustainability debates concerning how to meet current as well as future needs while balancing social, economic and ecological considerations. Energy is fundamental to individual and collective social and economic development. Furthermore, types of energy and how energy is produced and consumed not only impact nature and climate; it also shapes conditions for democracy and development. Thus, energy transitions - fundamental changes in energy production and consumption patterns that involve technological, economic, social and cultural changes - have impact on opportunities and challenges in development. We look at historical transitions to fossil energies as well as the discussions on transitions away from fossil energies. The burden and benefits in energy systems and energy transitions are unevenly controlled and distributed within and between countries. Peoples of the global South have less access to energy, while also suffering more from the consequences of climate change. Through the course, we discuss how the systems and conditions for energy transitions are shaped by historical and uneven relations between the Global South and North.

The different patterns, pathways, and experiences of energy transitions across different countries illuminate not only the inherent difficulties of pursuing sustainability but also the fundamental differences between the global North and South in terms of development priorities, capacities and challenges. Questions of justice, in terms of distribution of burden and benefits and roles in decision making over energy transitions is key.

Core issues of energy and development and energy transitions are addressed from the perspective of the global South and placed in the context of global sustainability. The awareness of a spatial perspective to development problems and processes will enable students to identify and understand the impact of regional and global processes on people's lives in specific places.

For further detail on learning outcome etc:

<https://www.uio.no/studier/emner/sv/iss/SGO2500/index.html>

About specific questions/tasks:

Students need to answer one question from Part I (long answer) and one question from Part II (short answers) to pass the exam, that is, a total of two answers. Failure to do so implies failing the exam.

First part – the long answer is ca 70% percent of the grade; second part is ca 30%

The questions are formulated around selected news briefs and tweets, and students are asked to discuss specific issues based on what they have learnt in the course throughout the semester. The aim is that students will be able to apply their knowledge to interpret the world around them. The questions are formulated in such a way that students are given room to structure their answer on their own. Good answers are those explicitly making use of basic concepts and approaches.

Questions are given in English. Students can choose to respond in Norwegian, Swedish, Danish, or English. English terms can be used for those answering in a Scandinavian language.

EXAM GUIDE

Questions are repeated below as seen by students in italics, while exam guide follows in italics.

Exam Questions for SGO2500 Fall 2024

LONG-ANSWER QUESTIONS (1500 words)

Choose 1 of the 2 questions presented below and write an answer of maximum 1500 words based on what you have learned in the course. The course syllabus should inform your answer. Please indicate the question number at the beginning of your answer.

Option 1.

The world is behind schedule to reach international climate targets to avoid a deepening climate crisis. The necessary (and delayed) green energy transitions (both "away from fossil fuel" and building renewable energy systems) come with both benefits and burdens. The climate urgency underscores the danger of injustices and deepened social and economic inequalities within and between countries (and generations). Different kinds of actors' demand that justice concerns should be part of energy transition strategies, directed at both national and international policy arenas. Below you see two examples that may inspire your reflections: The first is a screenshot from the ITUC-Africa webpage, a pan-African trade union body, demanding a just transition at the African Climate Summit in 2023. The second is a tweet showing a student at a Kenyan summer school on climate change, calling for a just transition from the Global North.

What kind of challenges to justice do you see in a green energy transition? How can "just transition" concepts help form strategies to avoid unfair burdens on countries and peoples of the global South in energy transition? You may want to refer to specific cases from readings, class or of your own knowledge in your answer. You may consider production as well as consumption of energy.



AFRICAN REGIONAL ORGANISATION OF THE
INTERNATIONAL TRADE UNION CONFEDERATION

ITUC-AFRICA

HOME PRESENTATION PROGRAMME AREA NEWS CAMPAIGNS AFFILIATES ATUDN

FLASH INFO : Our decolonisation struggle will be complete once our continent successfully achieves economic

Africa Climate Summit: African trade unions call for a just transition

Keywords : Newsletters ; Climate Change And Environment ; Kenya ;



Nairobi, Kenya - Against a backdrop of climate challenges and global disruption, the Africa Climate Summit took place in the Kenyan capital, Nairobi, from 4-6 September. At a time when Africa is facing the convergence of climate shocks, biodiversity loss, the impact of the COVID-19 pandemic and the aftermath of the war in Ukraine, African trade unions seized the opportunity to present their positions and advocate for a just transition.



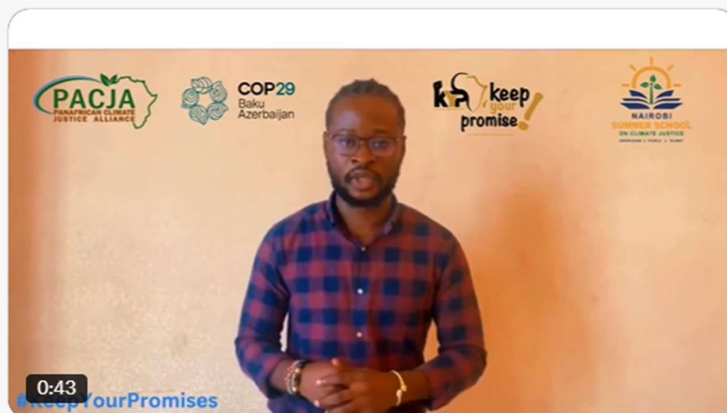
Nairobi Summer School on Climate Justice @Summer_School1 · 10t ...

"The clock is ticking for our Climate." @lurdizzy, our very own alumnus #NSSCJ4, calls on the Global North to honor their commitment to adaptation finance for the Global South, framing it as a crucial step in achieving a **just transition**.

#KeepYourPromises

@COP29_AZ

@PACJA1



3

5

12

152

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Grade guide option 1 (long)

This is a very open question, where students can draw from across readings and lectures.

Students should start by clarifying what a green energy transition is. In class and readings we have looked at examples of historical energy transitions to fossil fuels, while the green energy transition has two processes:

- *away from fossil fuel (a process that is moving slow, remembering that previous transitions also mainly is about adding new energies to existing, not so much replacing. Also fossil fuel is more profitable, and some powerful actors are not interested in transitioning)*
- *rolling out renewables*

The justice aspects concern the distribution of benefits and burdens in these 2 processes. We have emphasized how we can look at the full value chain from extraction, production and to consumption (and waste management), to consider actors who benefits in these (companies, states, local communities, workers, etc etc) – but also who have advantages and opportunities to benefit (capital, technology, power). Only the stronger students will pick up on all these details.

It is expected also that the students try to explain concepts of justice, and that different actors and processes are considered. Core readings from lecture 6, “justice in transition” (van Bommel + Muttitt)

- *In class, we talked about distributions of benefits and burdens + procedural justice as the core, while van Bommel + talks about three areas of justice (climate, energy, transition), and four types of justices*

Climate Justice: Foregrounds the justice impacts of climate change.	Energy Justice: Foregrounds the justice impacts of energy systems, energy technologies, and energy projects.	Just Transitions: Foregrounds the justice impacts of transitioning away from fossil-fuel usage.
	Procedural justice	
	Distributive justice	
	Recognition justice	
	Restorative justice	

(distributional, procedural, recognition & restorative):

- *in class, we talked about justices within and between countries, and between generations. Students should pick up on this, f ex in the tweets. The Kenyan tweet explicitly refers to North – South relations, they should be able to mention both scales/relations. Strong students could remember and reflect on historical legacies of unequal starting points in and between countries, in terms of energy transition (access to technology, capital, governance structures, power relations)*
- *we may not expect the students to consider all the aspects (2 energy transitions processes and three transition concepts, and four justice concepts, + geographical dimensions. Only a few will bring in all, it is a matter of the students argue their case on how they interpret the questions and want to answer.... we should be more concerned with understanding issues and processes than remembering all the concepts*

- Some may pick up the underlying question that is not explicit in reading, but mentioned in class: will transition challenge, deepen or confirm existing inequalities.
 - o There is a variety of examples to draw from,

The question also refers to students “may” consider, thus they can also choose not to reflect on both production and consumption, but they should reflect on the question.

- production: In readings Muttitt and Kartha discusses criteria for just phasing out of oil, emphasizing dependency on oil and capacity to transition as key criteria:

More difficult transition ⇨

	Lower dependence	Higher dependence
↑ Capacity to fund just transition	RAPID PHASE-OUT Without international support (e.g. Canada, Germany, Norway, UK, US)	SLOWER PHASE-OUT Without international support (e.g. Brunei, Kuwait, Saudi Arabia, UAE)
	MODERATE-PACE PHASE-OUT With international support (e.g. Bolivia, Mozambique, Tanzania, Vietnam)	SLOWEST PHASE-OUT With international support (e.g. Equatorial Guinea, Iraq, South Africa, Timor-Leste)
	Higher capacity	Lower capacity

- In class and in Panel discussion, we also referred to Norway’s argument of “clean production” (also used by other oil producers) vs the need for development (poverty levels, energy poverty etc.)
- Some students may draw attention to green colonialism literature and experiences of burdens in the global south when rolling out renewable projects, particularly large scale hydro-power initiatives; carbon-trading etc. Here the student may draw on examples from the readings, e.g. Lyons & Westoby (2014).
- Re consumption we have discussed
 - o SDG 7 (accessible and affordable clean energy) (reading Hancock, Kumar + Ulsrud, cases in India + Africa)
 - Women, rural and poor have less access to, but also cannot afford.
 - Strategy:
 - Rolling out (small scale) renewable as a way to replace less clean options (implication on women, health etc.)
 - Decentralized systems, should include local participation + cultural/contextual considerations
 - With extreme poverty – no system will easily be affordable, so other measures would be necessary (poverty alleviation/aid)
 - o Furnaro article on Chile emphasizes that consumers may be individuals, but also industries – who may resist transition (or promote)
 - o A key global strategy to reduce fossil dependency and climate emissions is removing fuel subsidies.
 - A justice perspective should include considering the increased consumption prices for energy (fuel) (reading Houeland, cases in Africa/global). This has lead to protests in several countries, where workers and activists express sense of social injustice because of the relative increase in burdens for poor and working class people

- *this also reflects North-South relations and injustices between producers and consumers: There is a tendency for northern/rich countries to subsidize oil production (benefitting companies/the rich/the producers), while demanding reduction in consumer subsidies (via UN, IMF, aid etc.) – mainly a burden for poor in the global South (although it also reduces emissions)*
 - *Strategies: alternative - affordable energies/transport + welfare (basic income, school)*
 - *Strategy; Cut production subsidies, not only consumption*

Strong students should be able to pick up on the “sustainable development” and the balance between economic opportunity and development need, and the ecological urgency. And they would be able to point to the dilemmas of justice considerations, especially considering the climate urgency on the one hand, and justice considerations on the other

- Empirically we have used Nigeria as a key example, and there should be opportunity for students to use examples from Nigeria on all aspects of justice

General strategies would start by using justice principles

- identifying “stakeholders” (depending on what kind of justice: those who are affected by climate change, or energy transition, lose jobs, lose land etc.)
- = procedural justice: involve them in decision making + consider compensation (not least at local level)
 - climate justice; considers those who are more affected by climate change
 - who pays: the emitter (rich, global north) should pay more (poor, global South more affected)
 - just transitions: considers workers and communities who may lose jobs in transitioning away
 - workers and communities can be compensated with new jobs or financially
 - energy justice: considers access and affordability of energy
 - danger of possible human rights and ecological consequences
 - reference to short answer question and Kirsten’s lectures on sub-Saharan Africa; decentralized energy + South – South learning can be a strategy
 - ex: cutting fuel subsidies (increased energy) should follow with compensation (other welfare, public transport subsidy, basic income grant etc.)
 - (and producer countries should follow up and cut production

- Restorative justice would also consider those who already have been burdened. We have not talked a lot about this, but mentioned f ex dilemmas when oil companies divest; they should be held responsible for cleaning up (oil spills). Sultana (2022) also mentions reparations and, more concretely, financing loss & damage.

Option 2.

Both markets and states play important roles in structuring energy systems and shaping energy spaces. Throughout the course, we have discussed this in historical terms, in relation to fossil energy systems and in the ongoing diffusion of renewables in the Global South today.

How do states and market actors at different scales (i.e. local, foreign, global) shape the emerging renewable energy spaces in the Global South? Consider different perspectives and/or challenges and benefits, in your discussion. You can choose to elaborate on the ways in which state and markets are intertwined. You may want to consider the roles of both local and foreign state and market actors.

The screenshot from The Guardian about Chile can inspire your answer. You may draw on empirical cases from different part of the course (such as Chile, Sub-Saharan Africa or other).

Sport
Culture
Lifestyle

The Guardian

Energy
Pollution

This article is more than 10 years old

Chile's solar market is leading the way in South America

The hot, barren lands of northern Chile make it an ideal location for generating solar energy, and the sector is flourishing



Chile's Cerro Dominador plant will be five times as large as Spain's Gemasolar. Photograph: HO/AFP/Getty Images

In Latin America, Chile has grown into the region's leading solar market. It has 400 megawatts (MW) of solar photovoltaic (PV) generation under construction - more than any other nation in the region. For comparison 400MW is nearly half the capacity of an average nuclear reactor. Unlike wealthier nations, Chile is building large solar projects without subsidies, and is breaking ground with new business models. The nation is also

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visma sign

«Det er bare fordeler med digital signering»

Les kundecase

Grade guide option 2 (long)

This question is very open, and the student can opt to understand the question in different ways. Thus, there is no simple answer to what to expect, but as a start, we should make sure they relate to all aspects in the question: arguments. Below is a rather detailed reference to arguments and examples. It is NOT expected that students use all these examples, but it is for examiners to get an overview of some of the issues and examples students CAN use. Students should get the ideas and processes, but are not expected to use /remember (all) the details in arguments/concepts:

- 1) *state and market,*
 - *we do not have explicit reading discussing the difference, but we have talked a lot about state and companies; and ideas/practices of state led development vs. market-based development.*
- 2) *The key is to consider different actors in and between different scales. There are mentions of*
 - i. *The state as an active agent and distributor of energy/power –as in Chilean history and as demanded by some activists today; The state can be a promoter of energy transition or an actor resisting the transition); the state can be an active reproducer of neoliberal power relations and facilitator for a market-based roll-out. (as the Chilean case).*

It may be picked up that international state organisations such as World Bank and IMF have been promoters of neoliberal energy policy.
 - *Financial resources are is needed, and often lacking in poor countries. Here, foreign capital can play a key role.*

Capital interests/companies/private actors can be linked to fossil (who are powerful, and have a global monopoly) and/or renewables; existing power/interests may often resist transition rather than promote; while capital can also be linked to renewables as in the case of Spanish capital seeking a ‘spatial fix’ for their over-accumulated capital in Chilean renewables (and Norwegian Scatec).

Companies/private actors are also be energy users – that can be promoting or resisting RE/transition

capital can be local + foreign. In Chile’s case – 75% of investments where foreign (2010-16)
 - *Social movements/resistance and/or alternatives; The readings mentions that not only the state – market nexus/actors - but also social actors as either resisting or promoting RE projects (especially at local level) + as promoters of local/public ownership/ energy democracy.*
- 3) *...in context of renewable energy.*

- a. *It can be an advantage to relate to background and context in terms of ideas, practices and history (including fossil energy spaces), but focus should be on how that shapes processes of renewables.*
- 4) *Concept of energy space/energy transition as space making process:*
 - a. *The main idea is for students to get the spatial process involved, not to repeat the specific definitions of space. (which some students find challenging). This should include that actors, processes, relations are constitutive and space making, and transition are constrained by, can confirm as well as reshape these relations: energy processes/transitions are shaped by historical context and re-shaping spaces.*
 - b. *In readings, 'energy spaces' is often described through the characterization of "uneven development" related to dynamics of accumulations (linked to processes of capitalism).*
 - i. *Energy spaces and the political economy processes, should be considered in scalar terms (f ex regional, local, global, rural-urban etc)*
 - ii. *Readings emphasise the need to understand "the political economy" and power relations in existing and new energy systems + consider the socio-economic as well as technological conditions, relations and actors (Bridge and Gailing).*
 - iii. *"energy transition is a space making process", + space is constitutive (as struggle). Energy transitions can (tend to) reproduce the political economy of energy/replicate regimes, while adding new processes of dispossession (esp land) through accumulation. Furnaro uses the concept "socioecological fix" to expand on the notion of spatial fix (overaccumulation of capital in one place is fixed in a new place), while RE adds new social and ecological dynamics*
 - iv. *With reference to different kinds of governance, bridge and Gailing refers to different types of governance and roles of the state (and energy democracy), while not detailing it.*

CASE- from reading (Furnaro) Chile is the main case in the Furnaro -article that most explicitly talks about these questions:

- *Chile has undergone a "renewable energy boom" (Furnaro 2019). In Chiles history (especially since the 1970s with deregulation and privatization) , market forces have played a significant role in this development – albeit with significant state-backing in various forms.*
- A key argument in the text is that the state has been important for RE boom, but in regulating market failures and being a driver of continued neoliberal energy system (i.e. state led neoliberal reforms).*

- *Consumers – not only individuals but industrial users of energy are key actors play roles in resisting and in shaping energy reform: the copper industry in Chile is important/large- and energy intensive. (Copper industry in itself has been state subsidized)*
- *Most RE investments have been private, by both local but in particular foreign capital, (esp from Spain),
This can be explained as a form of ‘spatial fix’ (overaccumulation in Spain – seeking investment opportunities in Chile). Also, research and development in countries like Germany was important for Chiles capacity to leapfrog into a mature solar technology (all of this is in Furnaro 2019).*
 - o *Strong students might also refer to Mazzucato that was mentioned in reading and class, arguing about the necessary role of the state: state should be active in stimulating new, green technologies.*
- *The Chilean model might be problematized, e.g. since Chile has not reached full renewable electrification of the grid (maybe mention the problem of energy addition instead of transition in a capitalist economy) and the local developmental effects might be limited due to limited distribution of gains and local jobs after construction.*

If students did not read the particular article on Chile, they should still be able to answer the question based on readings on small scale renewable energy in Africa (and India) (Kirstens 2 lectures)

- *It describes how renewable energy systems have tended to be implemented top down (from elites and from abroad, state + capital), while she talks about alternative bottom-up approaches where local actors are participants.*
- *For affordability – poor, rural / local will need support (from state or international aid actors).*
- *Conventional electricity systems/Central grids – (often state regulated with elements of private actors/funds) – do not reach all areas, and not all people living close to the grid have access/can afford.*
- *Megaprojects – such as hydropower projects – can be problematic*
- *Stronger students could reflect that a conflict line is more between “new” and “old”; and between scales, than between state and market: New technologies – often difficult to implement due to established systems, path dependency, and interests (power).*

National and International framework conditions + political interests: “there are indications that governments and other energy sector actors view small-scale independent power provision as competitors” (Ulsrud): i.e. both state and companies can hinder new actors.

This question also opens up for discussing the example of “electricity capital” (Luke&Huber 2022). (note that this is an article many students have commented to be difficult)

- They define “electricity capital” as “the nexus of state, regulatory, and financial relationships that shape private accumulation through electricity provision”.
- Electricity as commodity; commodification of electricity
- Here the student could underline that capital can come in different colours, both grey (fossil) and green (renewable) and as such can have certain interests in common with the climate movement.

Aware & strong students could pick up on the first paragraph of the questions to reflect from other parts of the lecture/readings, but should not get lost in these:

- *In early lectures and summing up, we emphasized that ideas and practices of “development” – and in energy governance /energy space – changed over time, especially in relations to the role of the state and marked. (also mentioned in Chile; at a point the state was “a developmental state”*
- *We have mentioned (but little reading) that the state was more active in early post-colonial time and during the 70s, whereas neoliberal thoughts have dominated (within the global North and South, and in policies towards the global South (aid, IMF) since the late 1970 with neoliberalism.*
 - o *Mitchell: talks about how politicians facilitated the transition from coal to oil (as a willed process) – whereas generally one thinks of transitions as marked driven,*
- *All this contextualizes the structural conditions for the role of the state and marked in renewables*
- *This also means that different actors in different spaces and scales, have different starting points in capacity to engage in renewable transitions (ie. States in the global south often have less policy space/resources, may be burdened with a lot of debt, while local companies may often depend on foreign capital etc)*
- *Innovations could also be mentioned as factors that can spur uneven development and changing energy landscapes. In Peder’s lecture different examples were mentioned, such as the role of fertilizer (from guano to artificial fertilizer) and the impact this had on geographical regions in Peru and Telemark, (Rjukan).*

In discussion in class, and in panel, we have discussed the dilemmas around the need for capital in the global South and the limits to ownership and control that this entails (politically and economically). Here they should be familiar with the Norwegian company Scatec.

SHORT-ANSWER QUESTIONS (500 words)

Choose 1 of the 2 questions presented below and write an answer of maximum 500 words based on what you have learned in the course. The course syllabus should inform your answer. Please indicate the question number at the beginning of your answer.

Option 1:

When Total Energy announced its oil production plans in Suriname, van Hulst (Vice-Chair Elect of International Partnership of Hydrogen & Fuel Cells in the Economy) tweeted a warning against the resource curse (see screenshot from X).

What is meant by the resource curse, and what is meant by the Dutch Disease? What are some of the criticisms of the resource curse? You can use examples to illustrate.



Noé van Hulst
@noevanhulst



The key question is whether [#Suriname](#) is able to avoid the pitfalls of the [#ResourceCurse](#) & [#DutchDisease](#). More on this in my book From Dutch Disease to Energy Transition, freely available on ciep.energy

[Oversett innlegg](#)



Energy Intelligence @energyintel · 22t

French major #TotalEnergies said Tuesday that it will move forward with a \$10.5 billion #oilproject offshore Suriname, providing a significant boost to the economy of the South American nation, which has so far produced only minimal volumes... Read more bit.ly/4dtEHPZ

3:35 p.m. · 2. okt. 2024 · 143 visninger

Grade guide 1 (short)

This refers to two lectures (3rd and 4th) on fossil energy systems and democracy; and on Nigeria and the resource curse. It refers to Ross' article (1999) and criticism (Watts 2004, Obi 2010).

A students should explicitly explain the resource curse:

- *Resource curse as described by Ross, refers to the paradox that countries with abundant natural resources (such as oil) tend to perform worse on development indicators: economic performance; democracy and peace
 - *In class I emphasised that later studies have concluded that this is not necessarily true for all kinds of natural resource, but oil in particular.*
 - *I mentioned Norway (and Canada) as exceptions.**
- *The article details many kinds of mechanisms, but I emphasized 2 as particularly important: "rentier states" + "Dutch disease". Even if we don't ask for the first, it would be good for students to mention (the two relate but are separate):*

- *Rentier state (can be mentioned, but not asked for): tendency in oil states to become undemocratic:*
 - *Rentenist economy: based on income without production. (i.e owner of land or oil live off from “rent” of using a natural resource, without refining. i.e. raw material based economy)*
 - *Rentenist (oil) state: tends to lean on income from oil in stead of from citizen tax, and still being able to provide a certain level of welfare (Middle Eastern oil countries). This also breaks the social and democratic relationship between state and citizen (and citizens are less likely to scrutinize their government)*
- *Dutch disease (should be explained explicitly): countries with (significant) petroleum production tow mechanisms can lead to loss of competitiveness/ decline in other national industries a) impact on currency (increased) leads to other export products get to expensive for the international market b) the relative ability for high wages in petroleum draws work force away from other.*
We have used Nigeria as a well known “prototypical” example of resource curse, of being a rentier state. We have mentioned (not in reading) that Norway has made policy measures to successfully avoid deindustrialization and rentier state (i.e pension fund, support to other industries, slow pace etc. details not expected)

Both Obi and Watts (and critique the resource curse theorist for assuming causation between oil and lack of development, even if agreeing that there is correlation between resource abundance and poor development indicators. In stead, they suggest that to understand that correlation, we need to understand:

- *The context and governance spaces based on political economy and power relations, including the historical legacy of colonialism*
- *The relations and actors to be considers are both within and between states,*
 - *Both emphasize in particular the companies*
- *The nature of accumulation (dispossession)*

In class, we mentioned that a resource curse perspective tends to conclude with technical solutions “governance”, policies and security measures as the solutions (as through aid programs, also Norwegian), whereas Obi and Watts suggest the need for redistribution of power and resources + democracy.

Option 2

Discuss different ways of understanding transfer of innovations between geographical regions with different contextual conditions, and how such transfer may contribute to inspiration, joint learning, and system innovation among different kinds of actors such as policy makers and practitioners.

Use examples from the field of small-scale solar electricity systems. Reflect briefly on the potential roles of national and international actors, the private sector, the state, non-governmental organisations (NGOs) and civil society in experimenting with innovative ways of providing electricity services in local communities.



Presenting Zonke Energy! They will pilot meshed solar mini-grids and home systems in the informal settlements of Cape Town, boosting energy access and community growth. More details at eepafrica.org/Portfolio/zonk...

#EEPAfrica #Sustainability #CleanEnergy
Oversett innlegg



Grade guide option 2 (short)

Since this is a short answer, it is not possible to include all of the following points, but the more dense, precise and nuanced the answer is, the better the grade.

An important starting point is the way spatial transfer of innovations/technology has mostly been seen both in research and international cooperation:

- *Transfer of innovations/technology has commonly been understood as transfer of technical hardware, expertise and financing from external sources into a country – often from the Global North to the Global South.*
- *Technology transfer has mainly been imagined as coming from a “sending context” to a “receiving context”.*
- *The social aspects of technology have not been central, such as the ways in which technology may gradually become integrated in society.*

- *Innovation taking place in the Global South is often ignored.*

After presenting one or more of the points mentioned above, the answer should move to alternative ways of understanding transfer of innovations/technologies. Some of the following aspects should be mentioned:

- *Transfer of innovations can be seen as a movement in the opposite direction - from within a country and outwards, as a search for relevant examples and knowledge by actors who want to learn from innovative solutions (e.g. energy solutions) developed elsewhere.*
- *Since innovation consists of both social and technical aspects that form “socio-technical systems” (such as energy systems), innovation can be seen as “system innovation”. The attempts to build up new societal systems takes place in specific geographical settings, influenced by contextual conditions including local-level socio-cultural characteristics and national and sub-national policies and other framework conditions (e.g. energy policies and regulations). National level framework conditions are in turn influenced by international actors and global processes.*
- *When engaged actors study examples elsewhere, they may get inspiration, ideas and new knowledge, and get insights into the lessons learned by involved actors, both on success and failure.*
- *Such inspiration and new knowledge can be a fruitful input in innovation processes and new initiatives at “home” where new solutions are tested out through practical experimentation in specific social contexts and adapted to these contexts over time.*
- *The learning from other countries/places can lead to long-term creative processes for involved actors – learning by doing that involves different levels of society (creating changes at different geographical scales) such as “institutionalization” of new energy solutions in governmental institutions.*
- *Transfer and exchange of knowledge between countries in the Global South can be fruitful because there can be important contextual similarities, although this varies.*

In the final, brief reflection that the students are asked for, they should show awareness of political or ethical issues of how different actors initiate, design and implement energy projects and systems and thereby carry out experimental activities in local communities where large portions of the population lives in poverty. Issues of Global North donors, investors, start-up companies and other businesses and their political and economic interests can be reflected upon. It is also relevant to mention the role of market actors versus state actors.

The answer should include examples from the field of small-scale solar electricity systems.

The second lecture by Ulsrud and the article by Ulsrud, Rohrer and Muchunku (2018) are central for this answer, but the first lecture and the other articles are also important for the understanding of the kinds of energy innovations that have inspired the research on transfer of innovations presented in the course.