

# ROUTE TO PARIS



**Unlocking climate change mitigation potential of Swedish forests**



## Route to Paris

**Editors:** Malin von Essen and Lotta Möller

**Text editing and layout:** Mats Hannerz,  
Silvinformation AB

**Cover illustration:** Frida Hammar

**Grafic form:** The communication office,  
Umeå University

**Print:** Hässleholms Tryckshop, 2024

**Contact:** Professor Camilla Sandström, Dept. of Political Science,  
Umeå University. +4670-219 63 44, [camilla.sandstrom@umu.se](mailto:camilla.sandstrom@umu.se).  
Analyst Per-Erik Wikberg, Dept. of Forest Resource Management,  
Swedish University of Agricultural Sciences, +4672-202 57 03,  
[per-erik.wikberg@slu.se](mailto:per-erik.wikberg@slu.se).

Route to Paris is funded by Formas, a Swedish government  
research council for sustainable development. Grant no. 2021-  
02145.

TEXT: **Tomas Lundmark**, Professor emeritus in silviculture, Swedish University of Agricultural Sciences.  
**Camilla Sandström**, Professor in Political Science, Umeå University.



## Do all roads lead to Paris?

Forests, covering nearly 70% of Sweden, are crucial in the societal transition towards a fossil-free future mandated by the Paris Agreement. Despite contributing significantly already, their contribution must increase, securing forests' carbon sink to buffer greenhouse gas emissions in various sectors. Simultaneously, forests are expected to provide more renewable materials to replace the use of cement and fossil-based raw materials. Given constant forest growth and societal consumption, resolving the conflict between forest use and conservation is challenging. In the interdisciplinary *Route to Paris* project, we explore the potential of Swedish forests to contribute to a climate-neutral society,

assuming that the Paris Agreement sets the direction, but that the path to the goal is still unclear.

The lack of clarity in pathway choices, both in Sweden and other countries, stems from a number of difficulties in governing climate change. Firstly, it is a long-term process in which many different actors and sectors must work in the same direction, and secondly, policy is not always unambiguous. Quite simply, there are different opinions on how to achieve climate change. This disagreement is only one of several dilemmas that, according to previous studies, can cause problems (Kemp et al. 2007) (Table 1). There is also un-

Table 1. Identified dilemmas hampering governance for transition and their potential solutions.

	Dilemma	Description of the problem	Potential solutions explored in <i>Route to Paris</i>
1	Ambivalent goals	Difficulties in identifying common problems and proposing relevant solutions	Collaboration and dialogue processes Structured problem solving
2	Uncertainty about causality	Lack of knowledge, unpredictability	Flexibility and increased adaptive capacity
3	Dispersed power	Sectorisation and fragmentation	Joint decision making
4	Political myopia	Policy fails to consider long-term effects of decision making	Acceptance of the need for transition
5	Establishing short-term steps for long-term change	Lack of connection between short-term decisions and the need for a long-term approach	Learning from previous transitions Scenario analyses to strengthen the link between present and future
6	Risk of lock-in effects	Sub-optimal solutions in a long-term perspective	Portfolio management/policy mix for a coherent governance strategy based on objectives and risk tolerance.

Adapted after Kemp et al. 2007; Sandström & Sténs 2015

certainty about what is cause and effect and which measures lead to the desired result. Often, power is dispersed across several sectors, so there is a lack of overview and conditions for joint action. Furthermore, politics often fail to make or stick to long-term decisions due to political myopia, which in turn weakens the link between short-term political decisions and long-term changes. Finally, there is a risk that decisions taken lead to unwanted lock-in effects that are difficult to overcome.

### **Route to Paris – a research project**

While it is recognized that it is difficult to govern for transition, there have been a number of historical shifts in forests. The Route to Paris research project delves into historical shifts in forests, examining Sweden's past (1950s, 1970s and 1990s) to identify success factors and failures, particularly in integrating different knowledge into transitions. We also work with different scenarios to identify the obstacles and opportunities that exist to motivate Swedish decision-makers and forest owners to switch to climate-smart forestry. We conduct dialogue processes and identify the opportunities and obstacles that exist in order to understand which new and innovative instruments stakeholders in Sweden prefer, and to what extent these instruments, alone or in combination, actually contribute to the transition. Finally, we ask what role the market, and in particular consumers, can play regarding the role of Swedish forests in the transition.

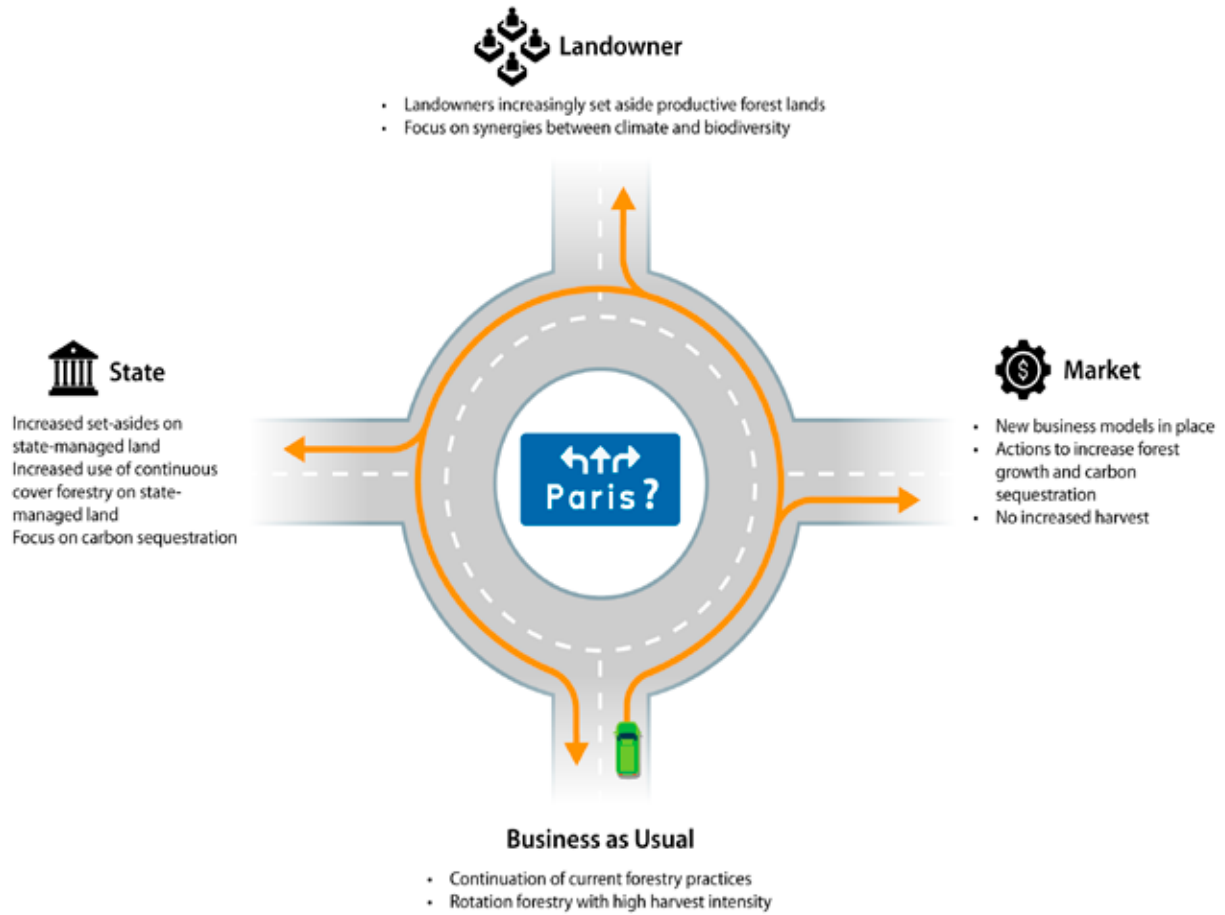
In *Route to Paris*, we present various routes from Sweden to Paris. Decision-makers must choose a route, and we provide knowledge on the advantages and disadvantages of different choices. Using three hypothetical scenarios (state, landowners, or market responsibility), we guide decision-makers (see figure on opposite page). The research project collaborates closely with stakeholders, aiming to develop innovative instruments stimulating climate-smart forestry among forest owners in Sweden. This publication offers an overview of the ongoing research, laying the foundation for stakeholder dialogue.

### **References and further reading**

Kemp, R., Loorbach, D. & Rotmans, J. 2007. Transition management as a model for managing processes of co-evolution towards sustainable development, *International Journal of Sustainable Development & World Ecology* 14(1), 78-91.

Priebe, J., & Jönsson, J. (2022). Hur skogen blev ett verktyg för att forma klimatet. *Skogshistoriska Sällskapetets Årsskrift*, 122–129. Retrieved from <https://urn.kb.se/resolve?urn=urn:nbn:se:umu:di-va-202496> [In Swedish]

Sandström, C. & Sténs, A. 2015. Dilemmas in forest policy development: the Swedish forestry model under pressure. In: Westholm, E., Beland Lindahl, K. & Kraxner, F. (ed.). *The future use of Nordic forests: a global perspective*. Springer, 2015, s. 145–158.



Visual representation of potential routes toward achieving the goals set in the Paris agreement, depending on which actor assumes a leading role in guiding policy and scenario analyses within the research project. Should we continue with business as usual and expect to reach Paris? Or should we prioritize market incentives, distribute efforts equally among landowners, or consider utilizing public land for public goods?



TEXT: **Janina Priebe**, Associate Professor in the history of science and ideas, Umeå University.

## The forgotten summit in Sundsvall – how the IPCC changed our views on climate action

When the UN’s body for assessing the science related to climate change, The Intergovernmental Panel on Climate Change (IPCC), was established in 1988, more than 100 years of research had been conducted on the change in the Earth’s climate and the role of greenhouse gases in warming the atmosphere. However, the origins of the IPCC are not just science, but also politics and the negotiating space in between.

### Urgency, consensus and precedence of interpretation

In the late 1970s and early 1980s, a series of scientific climate conferences were initiated. The scientific community agreed that climate change required joint efforts by several countries. The Montreal Protocol (1987), the international agreement to protect the ozone layer, was a source of inspiration. A statement from a 1988 conference in Toronto shows the consensus of scientists on ongoing global warming: “Humanity is conducting an unintended, uncontrolled, globally pervasive experiment, whose ultimate consequences could be second only to a global nuclear war.”

At the same time as the science was unified, the climate issue became more politicised. More and more decision-makers attended the scientific climate conferences. European states and particularly the US sought a transparent process with less influence from government environmental institutions and organisations. They wanted to create an independent body, the IPCC, to determine the state of knowledge on climate change – its causes, effects and possible responses. The IPCC would provide “neutral, politically relevant but not normative” input to international climate policy.

To safeguard the scientific integrity of the IPCC, it was open to expertise from all countries and its political independence was emphasised. However, the scientists on the

panel were appointed by their respective countries, giving them – at least indirectly – an ambiguous role. This picture is confirmed by the fact that between 1988 and 1990 the news media’s description of the Panel’s role varied. It is described either as a political arena in which conflicting state interests take centre stage or as a politically neutral scientific authority on climate change.

### What happened in Sundsvall?

After two years of “fact-finding” by IPCC experts, a four-day meeting in the Swedish town of Sundsvall in 1990 was to finalise a joint report. There was great pressure to find politically feasible proposals because the IPCC’s work would influence the UN’s work on a Framework Convention on Climate Change (UNFCCC) at the 1992 conference in Rio de Janeiro. The situation in Sundsvall was described as “a war of words”. The day before the meeting was



De hållade världen välkomna till Sundsvall och en konferens som blev avstätt stort internationellt intresse. FOTO: LARS ANDERSSON

### Varmt välkomnande till FN-konferens

The conference starts, Swedish Prime Minister Ingvar Carlsson and Environment Minister Birgitta Dahl welcome. Clip courtesy of Sundsvalls Tidning, August 1990.

The national press reported sparingly but the local newspaper Sundsvalls Tidning covered the UN meeting extensively. Clip courtesy of Sundsvalls Tidning.

due to end, Swedish meteorologist and Chairman Bert Bolin expressed his concern: “The science is not a major problem [...] but when we get into the other areas, the politics come in more and more.” Everyone knew that wording about consequences and the degree of uncertainty would influence political decisions. At three o’clock in the morning on Friday, 31 August 1990, “Professor Bert Bolin asked the delegates if they were prepared to accept the draft final document that had been worked out. He received a long round of applause.” The meeting was a success.

The invisibility of greenhouse gases has made scientists the intermediaries of climate policy, as only they are able to measure and calculate future emissions and atmospheric warming. Greenhouse gases can also be expressed in units that can be traded or influenced by policy instruments. Scientific statements therefore also become policy tools. In the process of the IPCC’s first report, scientists were well aware that their statements would directly affect governance and political decision-making. Critics pointed to the “watered-down” science, and the Sundsvall meeting has gone down in history as the IPCC meeting that was “forgotten”. Bert Bolin deliberately focused on consensus-based science, assessment of uncertainty and political neutrality. Those expecting direct political guidance were therefore disappointed. But the media coverage gives a glimpse of the meeting could not be placed squarely in the realm of science. Apart from this somewhat unclear role, however, it was the UN negotiations on a climate convention that overshadowed the IPCC’s initial groundwork. Nevertheless, it was an important step forward in establishing a process of science-policy collaboration that has since informed global climate policy and thinking about how to make the transition possible.

### References and further reading

Hermansen, E.A.T., Boasson, E.L. & Peters, G.P. 2023 Climate Action Post-Paris: How can the IPCC stay relevant? npj | Climate Action 2 (1), 30.

Hulme, M. & Mahony, M. 2010. Climate Change: What do we know about the IPCC? Progress in Physical Geography: Earth and Environment 34 (5), 705-18.

Lidskog, R. & Sundqvist, G. 2022. Lost in Transformation: The Paris Agreement, the IPCC and the quest for national transformative change. Frontiers in Climate 4:906054.











TEXT: **Andreas Eriksson**, PhD student, **Tomas Lundmark**, Professor emeritus in silviculture and **Per-Erik Wikberg**, Analyst. All at the Swedish University of Agricultural Sciences.

## Understanding system boundaries – how can forests provide the greatest climate benefits?

How should we manage the forest for the greatest climate benefit? Well, it depends. Decision making is based on a combination of values and facts. Although the balance between them can vary, in Sweden we often hear calls for evidence-based policy decisions. This applies regardless of whether the decision maker is a politician, consumer or forest owner. Transition means that the future should be different from the present. The decisions to be made must therefore be based on some kind of created evidence from the future. For this, we use forecasts and scenario analysis given certain assumptions, i.e. system boundaries. Regarding forests and climate, we regularly encounter some system boundaries, often interlinked, that affect our decision making.

### Spatial boundaries

The spatial boundaries extend from single trees via groups of trees, forest stands, properties, landscapes and nation-states, ultimately reaching a global scale. These boundaries exert influence in two distinct ways. If we cut down a tree, what other trees should we expect to compensate for this and vice versa, if we don't cut down a tree, does that lead to another tree being cut down?

The fundamental question is whether we have individual trees that sprout, grow, die and decompose or a system of many trees that cover all these phases? When a tree is felled, it is not there to absorb carbon dioxide or store carbon, only the emission from the ground at that location. In the case of selective felling, such as thinning in rotation forestry or harvesting in a continuous cover forestry, the distance to the next tree that can compensate is short. In case of final felling in rotation forestry, such trees are further away and belong to another stand.

But what happens if we don't harvest? Sawn timber, pulp, paper, cardboard and other products are traded on a global market transported all over the world. Assuming a constant

demand, the decision not to harvest will be compensated by harvest elsewhere, and emission leakage occurs.

This factor is mainly analysed globally between nation states, but the effect also occurs within the country's borders. For example, increased nature conservation provisions lead to increased harvest intensity on remaining forest area, if there is a demand, and no other restrictions occur.

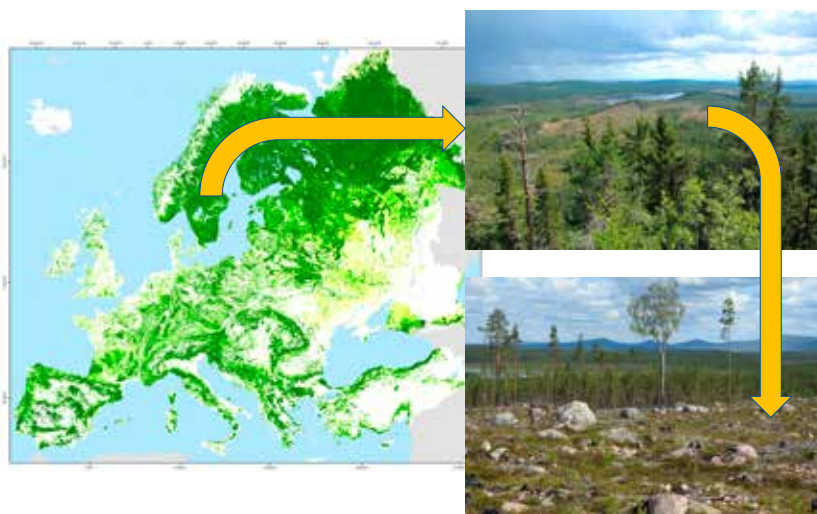
### Time frame

The delimitation of the time perspective obviously applies to the future but also to history. For the future, it is often a choice between the short term (perhaps a decade) and the long term (at least a rotation period and often up to a century in boreal forests).

Short-term analyses are often motivated by the fact that solutions to the climate crisis are time-critical based on political goals set within a generational horizon, or by the fact that the forecasts and scenario models become more uncertain the longer the period which they are applied to. Long-term analyses are justified by the fact that forestry in the boreal forest is a long-term activity, taking several human generations from planting to harvesting.

If you choose a starting point where the trees already exist, a temporary carbon debt arises when they are felled, until the new trees have grown up. You can also assume that the trees first grew up and then are felled, which leads to a different conclusion. On a large enough property, that enables an even flow of timber, growth and felling take place at the same time. All trees grow but the harvesting of the growth is concentrated on "mature trees". As long as removals is lower than the increment, there is no carbon debt; the forest becomes a carbon sink. Carbon dioxide is absorbed by the forest at the same, or higher, rate than it is removed by harvesting. The system perspective thus determines which conclusions are drawn.

Region, landscape, site. The spatial boundaries could lead to different conclusions. Photo: Mats Hannerz (site and landscape), EFI (Forest Map of Europe).



### Sectoral boundaries

The division of society into sectors is usually linked to political processes including goals, incentives, monitoring and evaluation. There is no specific global forest convention, but forestry issues are included among other land uses in, for example, the CBD<sup>1</sup> and the UNFCCC<sup>2</sup>. In the EU, which includes Sweden, the climate benefits of forests are mainly addressed through the LULUCF<sup>3</sup> sector. However, the sectoral delineation is not absolute; there is some flexibility for transfer between sectors, for example between LULUCF and ESR<sup>4</sup>, which makes it difficult to calculate the needs and benefits of the forest's contribution to climate mitigation.

The LULUCF sector includes the carbon storage in forests in living biomass, dead wood, soil and harvested wood products, which for Sweden means that the sector is a carbon sink due to the contribution from forests. If also agriculture or industrial removals where to be included the view of forests as carbon sink could change.

This sectoral delineation also omits the climate benefits that forests can contribute to by producing goods that substitute

fossil based products, known as substitution effect. This benefit is difficult to calculate. Do the wood products substitute fossil products or does the use of wood only lead to increased consumption? Which fossil products are substituted? In which countries? Will this change over time?

### Conclusion

When discussing the role of forests in climate mitigation, it is necessary to be clear about the system boundaries and assumptions. A holistic perspective is often needed for analyses of the climate benefits of the forests to provide effective decision support.

### References and further reading

Bergh, J., Egnell, G. & Lundmark, T. 2020. Skogens kolbalans och klimatet. Skogsstyrelsen. Skogsskötselserien kap 21. [in Swedish]

Nabuurs, G-J., Arets, E.J.M.M. & Schelhaas, M-J. 2017. European forests show no carbon debt, only a long parity effect. *Forest Policy and Economics* 75, 120-125.

Kallio, A.M.I. & Solberg, B. 2018. Leakage of forest harvest changes in a small open economy: case Norway. *Scandinavian Journal of Forest Research* 33, 502-510.

Lundmark, T., Bergh, J., Hofer, P., Lundström, A., Nordin, A., Poudel, B.C., Sathre, R., Taverna, R. & Werner, F. 2014. Potential roles of Swedish forestry in the context of climate change mitigation. *Forests* 5, 557-578.

Petersson, H., Ellison, D., Appiah Mensah, A., Berndes, G., Egnell, G., Lundblad, M., Lundmark, T., Lundström, A., Stendahl, J. & Wikberg, P-E. 2022. On the role of forests and the forest sector for climate change mitigation in Sweden. *GCB Bioenergy* 14(7), 793-813.

1 CBD (Convention of Biological Diversity) is a global agreement dedicated to promoting sustainable development.

2 UNFCCC (United Nation Framework Convention on Climate Change)

3 LULUCF (Land Use, Land-Use Change and Forestry) is an EU-regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry.

4 ESR (Effort Sharing Regulation), sets national targets for emission reductions from road transport, heating of buildings, agriculture, small industrial installations and waste management.

*"How sweet stress can be when you have chosen it yourself! And when you also succeed in what you set out to do!*

*Like when you build a wood deck. No one has asked you to build, no one has told you how it should look, and yes, you may not even know how to build a wood deck. But still, you are filled with an irrepressible desire to build just a wood deck. Why? [...]*

*[...] Afterwards, you hardly remember what you did, how you did what you did. You can only see that the wood deck exists. It is reliable. Relatives and friends inspect the work and say that "we didn't know you could build". Then you humbly shrug your shoulders and spit into the forest. In front of your in-laws, you know that you have fulfilled the unspoken graduation test of the son-in-law: you have built the wood deck, the wood deck that generations of capable people have built and will probably build for the foreseeable future. Of course you are proud in front of them, of course, but the most important thing is still that you feel satisfied with yourself, within yourself. That you succeeded in what you set out to do.*

*I also know that the wood deck I built will not be used very often. Who wants to sit on a wood deck in Norrbotten's coastal bushland when the mosquitoes are a tumbling mass of flesh that scatters your blood over marshes and swamps? But this is irrelevant. It is the journey, not the destination, that is worth the effort. Norrbotten is filled with wood decks where no one sits. And of satisfied wood deck builders who silently admire their work. [...]"*

*From Lyckan i att föda en altan [The happiness in giving birth to a wood deck] by Lasse Eriksson in the book Gode Gud, ge mig tålmod - men gör det fort. [Good God, give me patience - but do it quickly.] Translated by Karin M. Ekström.*

TEXT: **Karin M. Ekström**, Professor of Marketing, The Swedish School of Textiles, University of Borås, Sweden.



## The driving forces behind wood consumption – a need for cultural perspectives

### Forest, wood products and consumption

The role of the forest has increased in importance in the Swedish society during recent years, due to climate change. The forest can be interpreted in terms of, for example, economic value (market value), affective value (feelings), nostalgic value (longing for the past), historical value (appreciation of the past), experiential value (how it is experienced), placement value (how it is experienced depending on location, e.g. geographically, in relation to different tree species, wind turbines, etc.) and functional value (usability) (Ekström 2007). Other values are reuse and recycling values, which are about reusing or recycling wood products from the forest.

A production perspective on the forest has been prevalent in Sweden since the post-war period, that is, how the forest should be managed in order to produce timber. In a consumer society where climate change to a high extent is linked to consumption, there is need for a better understanding of consumption, i.e., how wood products are used. To what extent are the consumers' choice of wood products based on beliefs and knowledge about forests and wood products and does it vary in different socio-cultural contexts?

### Building of wood decks in an accelerating consumer culture

Which are the driving forces of consumption? Today, it is often considered better to buy new timber rather than reusing old timber. One reason is the low prices. Will the opinion of new versus reclaimed wood change as prices increase or will other factors influence the choice? Can more information about forests, timber and climate impact lead to environmentally friendly choices or are other factors imperative? Research shows that information can contribute to making better decisions, but in order to understand the driving forces behind consumption, cultural perspectives are needed. This can be illustrated with an example, building

of wood decks, a form of consumption that has increased in Sweden during the recent years.

The social norms related to consumption are strong. Increased welfare and the possibility to borrow money for consumption have probably contributed to more wood decks being built, but which are the actual driving forces? Is it about people wanting to increase their material comfort or is the increased construction of wood decks a result of the fact that homeowners in today's society experience an expectation to build a wood deck if you own a house?

The sociologist Zygmunt Bauman (1998) claims that consumption has come to replace work as a status marker. People's identity, i.e. how they see themselves and how they are perceived by others, is today often linked to consumption rather than to work. To deviate can mean both psychological and social risk-taking – consumption can both include and exclude.

### People influence each other to consume

The wood deck is an example of how people influence each other to consume. If a neighbour builds a wood deck, it often doesn't take long before other neighbours start similar projects. The economist Robert Frank (2011) discusses that our consumption decisions are not only influenced by income, but by other people's consumption and that this in turn leads to a spiral of increased consumption and indebtedness. Maybe after the wood deck construction, a replacement of the old grill and outdoor furniture is made, or maybe the planning of a fancy outdoor kitchen begins, that no neighbours have yet built?

The sociologist Colin Campbell (2015) describes how the pursuit of novelty leads to hyper consumption. In his historical description of the development of consumption, he (Campbell 1987/2018) emphasises the importance consumer

dreams have as a driving force. In today's society, consumer dreams are communicated via fashion and popular culture, including social media. These dreams are important to understand as a driving force even for the construction of wood decks.

### **A need for cultural perspectives**

Many people today have a positive attitude towards the environment, but still do not act environmentally friendly. A positive attitude towards the environment does not necessarily lead to environmentally friendly behaviour. There is a lot of research on this attitude-behaviour gap, that is, the difference between what you think is important and what you actually do. Even if you have the intention to act environmentally friendly, there may be hindering factors that prevent you from acting environmentally friendly. Ölander & Thøgersen (1995) describe these hindering factors as ability (e.g. knowledge, habits) and opportunities (e.g. life situation, financial situation, technical solutions).

The explanation for not buying environmentally friendly timber may be that people lack knowledge, have habits that are difficult to break or cannot afford it. More research is needed on people's choices based on cultural perspectives. For example, how do lifestyles and social structures in the form of income, class and gender guide the choices that consumers make and how are consumption choices influenced by the consumers' view of the forest?

### **Not seeing the forest for all the trees**

Direct contact between producers and consumers was lost during industrialization and instead intermediaries such as wholesalers and retailers were added. Even if forest owners and consumers nowadays do not have direct contact, they influence each other in the way they value, relate to and act in relation to the forest and its products.

Forest owners as well as distributors need to understand consumption, for example what consumers want and why. Consumers need to understand production and they increasingly demand transparency, i.e. information about the timber's origin, treatment and transport. Research with cultural perspectives makes it possible to see the forest and the



Inspired by the neighbours? Photo: David Bejhed.

consumption of its products with new eyes. An increased understanding of people's relations to the forest and the driving forces behind consumption of wood products is necessary at a time when climate change is largely linked to consumption.

### **References and further reading**

- Bauman, Z. 1998. *Work, consumerism and the new poor*. Buckingham: Open University Press.
- Campbell, C. 1987/2018. *The romantic ethic and the spirit of modern consumerism*, Oxford: Blackwell/London: Palgrave Macmillan.
- Campbell, C. 2015. The curse of the new: how the accelerating pursuit of the new is driving hyper-consumption. I: Ekström, K.M. (ed.), *Waste management and sustainable consumption, Reflections on consumer waste*, London och New York: Routledge, 29-51.
- Ekström, K. M. 2007. Creation and transformation of value. In: Brembeck, H., Ekström, K.M. & Mörck, M. (eds.) *Little Monster. (De) Coupling Assemblages of Consumption*, Wien: LIT, 107-127.
- Frank, R. 2011. Relative deprivation, inequality and consumer spending in the United States. In: Ekström, K.M. & Glans, K. (eds.), *Beyond the consumption bubble*. London och New York: Routledge, 165-173.
- Ölander, F. & Thøgersen, J. 1995. Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of Consumer Policy* 18, 345-385.

TEXT: **Johanna Johansson**, Associate Professor in Political Science, Södertörn University. **Camilla Sandström**, Professor in Political Science, Umeå University.



## The stick, the carrot or the sermon – on the conditions to steer for change

The first attempts to control global climate change were made in the early 1980s. From the very beginning, the assumption has been that the countries of the world should play the main role through international agreements, such as the United Nations Framework Convention on Climate Change (UNFCCC). However, the Paris Agreement, which is linked to the UNFCCC and formally entered into force in November 2016, showed that a range of other actors such as municipalities, cities, private companies, universities and environmental and charitable organizations can and should play important roles in limiting the global average temperature increase to 1.5 °C.

The Paris Agreement has actively encouraged new forms of governance and inclusion of different actors, thereby reframing and broadening the climate policy landscape. The agreement has highlighted the need to involve all sectors of society - not least the forestry sector. However, studies show that while the diversity of actors and sectors contributes to new thinking and innovation, it becomes more difficult to get an overall picture of whether all the commitments really contribute to achieving the climate goals. This raises the question of the role of individual countries. How can countries take advantage of the new climate policy landscape and govern more effectively to achieve climate targets in different sectors? What instruments are available and how accepted are they among consumers and producers in the forestry sector?

### Hard policy instruments

There are a variety of instruments that countries can use to steer the behaviour of consumers and producers. They are often divided into three categories: legal and administrative (laws, regulations, standards, supervision, agreements, environmental targets), economic and financial (taxes, subsidies, charges, payments for ecosystem services) and social and information-based (certification,

collaboration, information campaigns and advice). These categories of policy instruments are often referred to as the *stick*, *the carrot* and *the sermon* as they aim to influence and change the behaviour of private and public actors in different ways, such as producing climate-friendly products or consuming sustainably. In addition to these three, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which focuses on biodiversity and natural benefits – the equivalent of the Intergovernmental Panel on Climate Change (IPCC) – has identified a fourth category of instruments: rights-based instruments and customary law (participation, transparency, accountability, capacity building, human rights and justice).

In most cases, policymakers use a mix of different policy instruments to try to achieve set targets. It is important that the mix of instruments used stimulates and does not counteract the achievement of the climate targets, even though it can in many cases be a challenge to evaluate the overall effect of different types of instruments. Within Swedish forest policy, different instruments have different historical traditions, i.e., the stick, the carrot and the sermon have a relatively long and common history. Different types of actors have always preferred and advocated one or the other policy instrument, even though they have developed and changed over time, not least when environmental and climate issues have had a greater impact on policy and public administration.

### Soft policy instruments

How policy is formulated and, more importantly, implemented is crucial to achieving policy objectives. There are several instruments to be used that include stakeholders in decision-making processes, promote self-regulation, change evaluation criteria or influence companies' *code of conduct*. These instruments often aim to promote legiti-

macy or increase compliance with rules. One example of this type of instrument is the National Forest Program in Sweden. Within the framework of a collaborative process, stakeholders have been given the opportunity to influence future forest policy. The hope is that they will feel greater ownership of the objectives and measures established in the program. Research shows that this instrument can lead to increased trust between the stakeholders involved and greater acceptance of forest policy decisions and their implementation. However, financing, knowledge and leadership are also required for the forest policy objectives to be realized.

### Hard and soft policy instruments in climate and forest policy in Sweden

The Swedish Parliament adopted the government’s proposal for a climate policy framework in June 2017, which includes interim targets for 2030, 2040 and 2045. In 2045, Sweden should have no net emissions of greenhouse gases into the atmosphere, and thereafter achieve negative emissions (see Gov. Bill 2016/17:146). To achieve net zero emissions, supplementary measures may be credited. These are measures that involve increased net absorption in forests and land and emission reductions through measures abroad or through bio-CCS, i.e., the capture, transport and storage of carbon dioxide from biofuels.

Overall, Sweden’s climate policy is like its EU counterpart. The mix of instruments on which climate policy is based is based on the Climate Act, and otherwise climate policy is dominated by economic instruments. The most important policy instrument is the carbon tax, which is aimed at emission sources in the ESR sector, i.e., sectors that are not included in the EU Emissions Trading System (ETS). The tax regulates emissions from buildings, agriculture, waste management, transport and small-scale industry. However, some activities have a reduced tax, including forestry, agriculture and the greenhouse industry. In 2018, the bonus-malus - a system for taxing and subsidizing cars - and the reduction obligation, which requires the blending of biofuels in fuels, were introduced. However, bonus-malus will be abolished following the change of government in 2022 and the reduction obligation will be reduced to the EU minimum level.

One example of a soft policy instrument is the Fossil Free Sweden platform, which was initiated by the government in 2015 ahead of the UN climate summit in Paris. Fossil-free Sweden brings together companies, municipalities, regions and organizations that support the declaration that Sweden will become one of the world’s first fossil-free welfare countries (Table 1).

Table 1: Examples of policy instruments in Swedish climate and forest policy.

Policy instruments	Climate policy	Forest policy
Regulatory	Climate Act The Environmental Code Environmental quality objectives Building regulations Energy efficiency	Forestry Act The Environmental Code Environmental quality objectives Nature protection (national parks, nature reserves, biotope protection) Species Protection Act Cultural Environment Act Reindeer husbandry Act
Financial	Regulated and voluntary emissions trading Energy and carbon taxes Climate investment programs Electricity certificates Subsidies for energy efficiency and renewable energy Tax exemption for biofuels/quota obligation CO <sub>2</sub> differentiated vehicle tax	Nature conservation (nature conservation agreements, LONA) Subsidies for deciduous forestry Subsidies for saving cultural environments or preserving natural values/restoring/rewetting wetlands Subsidies under the EU’s common agricultural policy
Information-based	Fossil-free Sweden Information and advice (e.g., energy) Education and research	Information and advice Collaboration and dialogue processes (objectives) Certification (FSC, PEFC) Education and research
Rights-based	-	-





Figure 1. Consumers and producers are guided by regulatory, economic, informative and rights-based instruments in climate and forest policies. They also tend to prefer and thus advocate different types of instruments (Sandström et al. 2020). Illustration: Jerker Lokrantz.

Within the Swedish forest policy, which operates under the principle of “freedom with responsibility”, information-based and soft instruments dominate. This applies not least to advice to landowners and collaborative processes involving several different stakeholder groups (Table 1). The few economic instruments that exist, such as nature conservation agreements, are primarily aimed at nature conservation, but the protected forest can also function as a carbon sink. Market-driven certifications are also central in forestry, mainly certifications for responsible or sustainable forest management, such as the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC). This development and demand for new policy instruments shows a need for research that examines different actors’ acceptance and preferences for the stick, carrot and sermon and how these tools can be developed to meet today’s need for improved target achievement, and also include IPBES’ fourth category of instruments (Table 1).

The role of forests in the climate policy landscape is currently unclear. Further proposals are expected in the co-

ming years, not least within the framework of the EU’s sustainability package, the Green Deal. It is likely that the current development of stricter climate targets in the EU may create a need for a different type of (forest) governance. One example is the emergence of carbon credit markets, which provide incentives for landowners to align with climate and forest policy objectives. Additionally, proposals like establishing an EU certification framework for permanent carbon removals, carbon farming and carbon storage in products aim to advance these goals.

To increase the conditions for achieving the EU’s climate goals, the EU Forest Strategy from 2021 highlights the need to give landowners and others active in forestry financial incentives to store and sequester carbon dioxide in the forest. The strategy also includes a proposal for legally binding instruments to restore ecosystems. The Swedish Forestry Agency’s latest in-depth evaluation of the Swedish Sustainable Forests environmental objective (2022) also emphasizes the importance of economic instruments and measures to create a profitable business model for biodiversity and increase the resources for con-

ducting supervision. Further, the Climate Policy Council has pointed out that Sweden will not achieve the goal of climate neutrality with current conditions, policies and instruments. A major challenge is therefore to find a mix of hard and soft instruments that do not counteract each other and that have a high degree of acceptance from producers and consumers.

### The way forward?

According to the Climate Policy Council, the pace of Sweden's transition to a fossil-free society should be increased and problems with current instruments should be addressed if we are to achieve the climate targets. There is considerable ambiguity in the forestry sector as research also disagrees on what is best in the short and long term - should the forest primarily grow and be used to substitute fossil products, or should it primarily be left untouched and store carbon? Which objectives should be the focus of political control and is it possible to increase the use of instruments that create incentives for individual forest owners to take their own initiatives to contribute to the climate transition? To take advantage of the climate policy landscape and achieve the goals of the Paris Agreement, research shows that it is essential to develop 'next generation' instruments, focusing on appropriate regulations, carbon credit markets and collaborative processes, and which are accepted by producers, consumers and various users of the many values of forests.

### References and further reading

Appelstrand, M. 2017. Miljömålet i skogsbruket: Styrning och frivillighet. Lund: Sociologiska institutionen, Lunds universitet. [In Swedish]

Bali, A. S., Howlett, M., Lewis, J. M. & Ramesh, M. 2021. Procedural policy tools in theory and practice. *Policy and Society* 40(3), 295–311.

Bemelmans-Videc, M. L., Rist, R. C. & Vedung, E. O. (ed.). 1998. Carrots, sticks, and sermons: Policy instruments and their evaluation (Vol. 1). Transaction Publishers.

Brännlund, R., Kriström, B. & Lundgren, T., 2022. Mål och medel i klimatpolitiken. 22:10:01. Myndigheten för tillväxtpolitiska utvärderingar och analyser. [In Swedish]

Howlett, M. 2022. What is a policy tool?: An overview of the tools approach to public policy. *The Routledge Handbook of Policy Tools*, 3-18.

Gunningham, N. & Sinclair, D. 2017. Smart regulation. *Regulatory theory: Foundations and applications*, 133-148.

Jordan, A., Huitema, D., Van Asselt, H. & Forster, J. (ed.). 2018. *Governing climate change: Polycentricity in action?*. Cambridge University Press.

Sandström, C., Kanyama, A. C., Rätty, R., Sonnek, K. M., Nordström, E. M., Mossing, A. & Nordin, A. 2020. Policy goals and instruments for achieving a desirable future forest: Experiences from backcasting with stakeholders in Sweden. *Forest Policy and Economics* 111, 102051.

#### CLIMATE POLICY IN SWEDEN AND THE WORLD

- UNFCCC - United Nations Framework Convention on Climate Change/ Kyoto 97/Paris Agreement 15/Agenda 2030
- EU climate policy 2021-2030 (Climate Law 2021, ETS, ESR, LULUCF)
- Environmental objectives
- Sweden's climate policy framework 2017 (Climate Act 2018, climate policy action plan, climate targets, Climate Policy Council)

TEXT: **Jimmy Jönsson**, Researcher in the History of Ideas and Sciences, Lund University



## What can we learn from historical transitions?

Contemporary forest owners are expected to participate in a transition to a future climate neutral society. However, an analysis of this societal project does not need to depart from the horizon of the future, or even from the climate debate. Lessons can also be learned from historical transitions.

### The transition to a welfare society

One relevant case is the Swedish so-called “record years” during the 1950s and 1960s. The country “broke records” in economic growth, jobs and housing. In addition, the government implemented several reforms which contributed to a general increase in the standard of living. In this process, politicians started to seriously consider forests as a resource. A mechanized and rationalized forestry sector would, alongside other industries, finance the welfare society. The forestry sector was helped by innovations such as chain-saws, tractors and chemical pesticides, but also older techniques such as planting and clearcutting. Thus, Sweden was “modernized” or, using a contemporary expression, “transitioned” to a welfare society with the help of the forest.

### The forest owner movement’s distribution of knowledge

In this context, it is interesting to observe the Swedish forest owner movement’s distribution of knowledge among forest owners. The politics and technology to mechanize and rationalize the forestry sector was in place, but one component was still missing. Half of the country’s forests were in private hands. Many private forest owners identified themselves as farmers instead of “silviculturalists” and managed their forest as a side project. Consequently, it was argued that private forest owners needed to more actively engage with “sustainable” forest use for the sake of the industry. In addition, they needed to stay updated with the latest technological and administrative developments that followed from mechanization. At its disposal, the state had a forestry law and advisory forestry boards. Nevertheless, a crucial role

was played by a cooperative forest owner movement and its organisations, which, among other things, invested substantially in knowledge campaigns: contests, journals and so-called study circles where the forest owners gathered and learned together.



An important foundation in the mechanization of the forestry sector was the introduction of the chainsaw. This picture was taken 1948 at Söderfors at the border between the provinces of Uppland and Gästrikland in Sweden. Source: SLUs Forestry Photo Archive.

What were the main characteristics of the forest owner movement's knowledge campaigns? It is possible to discern some overarching patterns. Partly, the forest owner movement seems to have preferred to lead the forest owners with knowledge as a "carrot" rather than legislation as a "stick". According to the movement's representatives, the important thing was the forest owner's "own initiative", not "stiff regulations and law paragraphs". Despite their bottom-up approach, it seems that the knowledge campaigns were clearly normative, at least in part. Instead of top-down information transfer, they were characterized by a more identity-forming *Bildung* ideal which would help the forest owners make the "right" decision of their own accord. For example, one forest owner representative advocated the creation of "a new consciousness" among the forest owners: "it should run in their blood that the forest ought to be just as well-managed as the soil".

### **A new knowledge culture?**

The record years' and today's transition differ in many ways. For instance, the emerge of global climate politics in the 1990s has contributed to the linking of national and international politics about climate and other environmental issues in ways that lack parallels during the 1950s and 1960s. However, there are still lessons to be learned, among other things, about differences between top-down information transfer and identity-forming *Bildung*. Could contemporary forest owners view their forest ownership differently? Is it possible to create knowledge cultures —"a new consciousness"—where the climate transition is an obvious point of departure, just like the mid-century forest owners gradually started to view the industry as a natural benchmark? These historical methods of consciousness-raising could constitute approaches relevant to today's mix of policies.

### **References and further reading**

Mårald, E., Sandström, C., Nordin, A. *et al.*, 2017. Forest governance and management across time: Developing a new forest social contract. Abingdon: Routledge.

Persson, B., 2016. Skog, jord och bönder. In: Eriksson, F. & Eriksson, P. (ed.). Perspektiv på lantbrukets organisering: Historiografi, begreppshistoria och källor. Stockholm: Royal Swedish Academy of Agriculture and Forestry, 2016, 183–200. [in Swedish]

Skogsägaren: Tidskrift för skogsbruk och skogsekonomi (1925–1978). [in Swedish]



TEXT: **Mats Hannerz**, PhD, forest communication consultant, Silvinformation AB



## The climate dispute – what are the causes of the conflicts?

Forests play an essential role in climate mitigation. Politicians and others involved in the climate debate agree on this. But how? This is where views diverge. Cherry-picked research results can be used to prove that forests should be preserved for carbon storage while others point towards the positive effects of managing forests for high volume production and replacing carbon-intensive materials with forest products. Which conclusions that are drawn from the research are often based on values.

The forest industry argues that climate change means that forests should be actively managed, while the environmental movement maintains that clear-cutting and the use of short-lived forest products should be reduced to minimize emissions. Opinions also differ among Swedish politicians. It is not easy to make decisions about the direction of climate action when those decisions have consequences not just for the climate but also for biodiversity, the economy and employment.

Most people agree that, in the short term, carbon sequestration will be greatest if forests are left undisturbed. This is based on the sequestration effect being greater than the substitution effect, i.e. forests store more carbon dioxide than would be emitted by replacing forest products with other climate-impacting products. In the long term, however, the climate benefit will be greater if forests continue to be utilized. This is because a forest's net ability to sequester carbon dioxide decreases over time. As forests grow older trees will die, be felled by storms, or suffer insect damage. Ultimately, rates of growth and decomposition will be about the same, meaning that the forest is neither a source nor a sink of carbon. If large-scale fires occur, a forest can even become a net emitter of carbon dioxide. Meanwhile, if a forest is managed for long-term, high levels of growth it will function as a carbon sink long into the future.

This is one of the big dividing lines in the debate – the time frame. Those who advocate for reducing logging point out that all measures must be implemented NOW if the 1.5-degree target is to be reached. From this perspective, forests are the major carbon sink in Sweden, even taking into account that less logging may lead to greater dependence on fossil fuels and carbon-intensive materials. In contrast, proponents of active management point out that the climate benefits will be greatest if forests continue to be used. They believe that this is the only way to abandon fossil fuels.

Another dividing line is trust in technical solutions. Carbon capture technology (Bio-CCS) means that using biofuels can actually reduce the amount of carbon dioxide in the atmosphere by removing the carbon in the biogenic cycle. Other technological leaps could involve wood replacing greater amounts of cement and steel in buildings or fossil fuels in aviation and land transport. The only question is how soon such solutions can be realized.

A third point of contention, which is largely about values, is whether we are prepared to reduce our consumption of forest products such as toilet paper, building timber and bioenergy for district heating. If Sweden produces fewer forest products logging would inevitably be reduced, but if consumption of these products continues at current levels the effect will be to either import timber from elsewhere to supply Swedish industries or push production abroad.

### Is science providing the answers?

Up to this point, everyone involved in the climate debate can participate and take a position based on their values. But what support can the science offer us? There have been numerous studies into how different ways of managing Swedish forests will affect their short- and long-term carbon balance. Again, it turns out that different starting points



Split views in the climate debate. Collage: Johanna Johansson.

and basic assumptions can sometimes lead to completely different conclusions. When evaluating a piece of research, it is important to consider what system boundaries have been used (described in more detail on page 10-11). As mentioned, the time frame is one important boundary. Studies at the national and regional level often show that reduced felling is positive for the climate over one to a few decades, while century-long forecasts usually show that more active use of forests is more beneficial for the climate.

Another boundary is spatial scale. In a single stand, clear-cutting means that the forest releases more carbon than is sequestered for 8–15 years before the tree canopy closes and compensates for the soil's natural carbon leakage. In the short term, felling therefore adds to atmospheric carbon dioxide, but over a 30–40-year term the forest becomes a carbon sink because middle-aged forests sequester the most carbon.

Studies of whole landscapes, encompassing a mix of clear-cuts, young forests and older forests, can lead to different conclusions. It is the combined effect of the entire forest landscape that affects the carbon dioxide content of the atmosphere. At a landscape scale, the effects of young, net-emitting forests can be compensated for by middle-aged forests nearby which are powerful carbon sinks.

Another factor which contributes decisively to different studies reaching different conclusions is how they treat substi-

tution. Raw materials from forests can be used in place of climate-impacting materials such as fossil energy, plastic, metal and cement. Long-lived wooden structures store carbon for decades, while short-lived ones such as biofuel and hygiene items cause carbon dioxide to be returned to the atmosphere within a few years. Research estimates of avoided fossil carbon per kilo of carbon in the felled tree vary widely, from 1 to 3 kilos, depending on which components are considered. Should the forest industry's internal energy consumption be regarded as substitution? How should items, such as graphic papers, for which there is no fossil alternative, be handled? And what happens in the long term if fossil fuels are phased out by wind, solar and nuclear power - surely then the substitution effect would not be so great?

Finally, we have the issue of forestry systems, not least the question of clear-cutting versus continuous-cover forestry. This has been the subject of many articles and, here too, the conclusions depend on which system boundaries in time and space have been applied.

Proponents of any position can find support for their arguments in the research: it is simply a case of selecting studies.

### Reference and further reading

Hannerz, M., Lundmark, T., Arnesson Ceder, L. & Eriksson, A. 2024. Forestry and climate – what does science tell? Rapport Skog 2024:1. Swedish University of Agricultural Sciences. [In Swedish with English summary]

Forests, covering nearly 70% of the land area, are considered to have a key role in Sweden's transition towards a fossil-free society. Although forests already make a significant contribution, the Paris Agreement calls for their role to be strengthened. In the interdisciplinary research project Route to Paris, we analyse the Swedish forests' potential to contribute to reaching climate targets.



The research project builds on close collaborations with actors who wish to partake in and develop innovative concepts that can stimulate climate-smart forestry. This pamphlet provides an overview of the research being carried out in the project and lays the foundations for dialogue between actors.



UMEÅ UNIVERSITET



LUNDS  
UNIVERSITET



HÖGSKOLAN  
I BORÅS

