How to handle a finite world: Cap and Trade

The world is in a clear transition, a transition that is so full of uncertainties that it is not yet clear where we will end up. Will it be a catastrophe, a dystopia, or a utopia? What 'system change' is needed? What is the nature of the transition? Will this be the end of capitalism, growth, democracy, freedom? From a great distance, the transition can be interpreted as follows: for two centuries we have known seemingly limitless (and hidden exponential) growth and progress. Yet there were indeed boundaries that were limited unnoticed (?) and they are now breaking us down. The earth is finite. The atmosphere is finite. Fresh water is finite. The Netherlands is finite. It is the confrontation with these finitudes that causes the transition. And there is only one answer: We will have to adapt our society and learn to deal with finitudes by drawing boundaries and making choices. That is the task for the Netherlands and the world.

Most economists are advocating new tariffs[i] to address the problems of the transition. By putting a price on CO2 emissions, a transformation to a sustainable economy (with less CO2 emissions) will be initiated. The market will do its work through the laws of supply and demand. The disadvantage of this solution is that levies will lead to a lot of resistance (with a risk of social unrest) and have unintended effects, necessitating correction for the 'bottom' of society, which makes the regulations even more complex. I advocate a fundamentally different course: Cap and Trade. 'Cap and Trade' sets a clear boundary and divides. The division restores the sense of justice in society and is the basis of political support. The market provides an effective redistribution, which is necessary in a dynamic society with many different wishes and ideas.

With the 'Cap and Trade' principle we can incorporate the finite nature of people and the Earth into the economic process. The finitudes concern common 'assets' and are laid down in a Cap (an arithmetic limit, or ceiling) and distributed fairly. This part is the responsibility of the government. Ten follows the 'Trade'. In a market, the named 'asset' can be traded. 'Cap and Trade' is therefore at the same time a blueprint for a new relationship between government and market. The government guards the borders. The market regulates the efficient allocation of resources. The 'assets' are common possessions from which everyone can derive (virtual ownership) rights. Citizens of a 'Cap and Trade' society have (quantitative) rights to (clean) air, water, energy, housing, healthcare, labor, education and free (social) time. The government has a duty to establish, distribute, monitor and, where necessary, regulate the market.

'Cap and Trade' is often used synonymously for the European ETS. With this system, introduced in 2005, the European Commission sets an annual maximum CO2 emission and distributes emission rights. Initially, companies were given free emission allowances for competitive reasons, but nowadays large European companies increasingly have to buy CO2 allowances at an auction. Companies are allowed to buy

and sell emission allowances on a stock exchange. In the Netherlands, the proceeds from the auctioning of emission rights go to the treasury, but because the atmosphere belongs to all of us, it would be better to distribute the proceeds to the rightful owners[ii].

The 'Cap and Trade' principle can be applied to more finitudes of people and Earth. I will give five examples. When we apply 'Cap and Trade' broadly, it means the end of traditional (open-ended) capitalism and the beginning of a whole new type of capitalism, participatory capitalism, in which the trade in community values of people and the Earth is central. 'Cap and Trade' is a new paradigm that puts distribution above growth, and participation over consumption. The examples below illustrate these shifts.

Carbon allowances globally

To begin with, let's establish a global 'Cap and Trade' system for the world's carbon accounting. The Cap was already set in Paris in 2015: a maximum temperature rise of 1.5 degrees in 2050, which is concretely quantized to 0 GtCO2 emissions from fossil combustion worldwide in 2050. In order to ensure balanced accounting, it is necessary that the natural capital of forests is also valued in a tradable CO2 right. The Cap target to 2050 for fossil emissions is set in a linear series: 33 Gt (2025), 27 Gt (2030), 20 Gt (2035), 13 Gt (2040), 6 Gt (2045), 0 Gt (2050). For the CO2 absorption by forests, we assume that no forest felling takes place worldwide and the series for all years is equal to -40 Gt.

Once the CAP has been established, we need to distribute the CO2 rights among the nation states of the world. The most equitable thing to do is to divide the target on the basis of the population of the nation states. Countries are allowed to trade CO2 allowances among themselves. At the World Bank, data is available *per nation-state* on (fossil) emissions and CO2 absorption of forests, calculated on the basis of the km2 of forest area per nation-state. Every 5 years, the account (and a new budget) is drawn up. Although the Netherlands now emits less CO2 annually, our prosperous country will not be able to avoid buying CO2 rights from other countries due to its high CO2 emissions per capita and the small forest area. These other countries will be forest-rich developing countries in particular, whose emissions (minus absorption) are lower than their national target. This Trade offers sufficient flexibility for nation states to achieve their goals, but at the same time ensures that 'poor' developing countries are given room for prosperity development, in which the preservation of forests (negative CO2 rights) is also of great (economic) importance. This system achieves a high degree of climate justice in which the rich West de facto transfers resources to the former colonial South.

In my opinion, the use of UN funds or a UN control system is too centralized and bureaucratic. To prevent fraud and gain maximum transparency, all transactions are registered in a blockchain, connected to a website. On the website, everyone can check what a country's (climate) debt or debt is. The transparency of a blockchain will further

mobilize citizens, companies and governments to reduce CO2 emissions, and plant additional trees, which can be immediately incorporated into this global CO2 accounting.

Carbon allowances national

When Barbara Baarsma proposed a tradable CO2 budget for individuals and all companies in August 2022[iii] , she received a wave of criticism[iv] . But this Cap and Trade proposal is very effective. The only thing that was missing was 'context' and vision[v]. That is why I am developing this proposal again here from the paradigm of 'Cap and Trade'. To begin with, the government sets an annual **maximum** carbon allowance (CR) for citizens and for each business sector. Every citizen gets an equal share. Companies receive rights in proportion to their annual turnover. The CRs are deposited by the government into the CR accounts of individual citizens and businesses. To this end, the Dutch Central Bank will open special digital accounts for citizens and businesses. CRs are tradable on a CR exchange. There are separate exchanges for citizens and the individual sectors. So, they can't trade CRs among each other.

With the carbon rights, every citizen and every company receive rights to emit carbon. Emissions are recorded in three ways. First of all, through the energy bill. Businesses and households consume electricity and gas. Contracts with suppliers stipulate a price per kWh and a price m3 of gas. I propose to add a CR/kWh and a CR/m3 in each contract. Carbon allowances, secondly, are charged when you fill up your car with petrol. Again, the supplier will have to indicate how much CR/litre the petrol costs. And finally, carbon rights are paid when you buy meat in the supermarket or at the butcher. In addition to a price per kg, the price in CR/kg is also shown on the label. The energy supplier, the petrol station and the supermarket will deduct the carbon consumed from your CR account at the same time as the financial transaction. Your debit card must therefore contain the details of your CR account. The consumption of a carbon allowance (CR) is registered fully automatically (with encrypted blockchain transactions) and can be checked via your own digital account. The emission allowances issued to citizens and businesses are free of charge. But the Cap, as with the ETS, decreases by 2.2% annually. The trading price is a good indication of whether supply and demand are in equilibrium and whether the Cap should not fall faster or slower.

Some political parties are advocating a meat tax or a meat levy, but I do not think that pricing food is right. It is not fair to the poor, has a stigmatizing effect and accentuates the differences between rich and poor. It is better to work with meat quotas in the form of carbon rights. Others will find the extensive registration problematic and argue for an extension of the ETS to small and medium-sized enterprises. But it is individual behavioral changes that are accelerating companies' transitions. And for that, citizens must be given control over their own CO2 rights.

Transport rights

The principle of 'Cap and Trade' can also play a role in the regulation of traffic and transport. The congestion problem is increasing again in the Netherlands. We cannot combat traffic jams by laying more asphalt, because that space is desperately needed for other things. That is why economists have been arguing for years for a kilometer charge or a rush hour charge, but this hurts everyone and causes social unrest. It is better to opt for a 'Cap and Trade' solution in which tradable transport rights are distributed. Calculate the annual capacity of (a selected part) of the traffic network, expressed in km-hours; Car owners and businesses receive a special transport account from the government into which an equal share of the transport rights is deponated annually. Just like with car-sharing systems or public transport, we use a chip card for check-in and check-out. Rush hour kilometers are more expensive. If more than one person has checked in the car, the costs will be divided among the occupants. The km-hours driven are automatically debited from the individual transport account. If someone has insufficient funds, you will receive a hefty fine, but car owners can also buy extra mileage hours in advance from people who have mileage hours left over on a special transport exchange. Transport rights can be an effective system to combat congestion, sparing the 'poor of society'.

labor time rights

Capitalism will change even more radically if we build the 'Cap and Trade' principle into the foundation of the economy: labor. The labor market in the Netherlands is functioning poorly. Our current labor market is a fighting market, over-regulated, segmented, with a lot of illegal labor and constructions. We have major shortages in the service sectors, the labor market is torn apart by 1 million flex workers, 1 million migrant workers, 1 million people with a ‘distance’ to the labor market, and a large army of volunteers and informal carers who simply do unpaid work. These are all results of a government that is mesmerized by market thinking and has no eye for the limits of labor. Labor is endlessly abused by the economy, causing workload and working hours to grow and people (just like the Earth) to get sick.

It is better to treat labor and labor income of citizens as a finite CAP that is used for the development of the economy and society. The employee ‘owns’ his or her ability to work. But it is society that must guarantee the right to work and labor income of every individual. Everyone has equal rights to work, which is why I propose to set a part (e.g. 80%) of the total working time in the Netherlands as a Cap and then distribute it equally among the employed population. Citizens can sell their working time rights (ATR) to each other on a regulated exchange. Once people are working, they can 'cash in' their working time rights with an ATR transaction where they receive (through the employer) a basic wage from the government and a additional salary from the employer.

The complete ATR cycle is as follows. The government periodically gives all citizens an equal amount of tradable ATRs. Citizens/employees transfer these ATRs to the employers in their employment relationships (an automated transaction: check in/out of a government time clock). The employer delivers the ATRs to the government and receives the basic salary of employees for this. The employer becomes, via the surrendered ATR, a conduit of the basic wage for employees. Employer and employee negotiate the amount of ATRs exchanged in the employment relationship and an additional salary from the employer itself. The basic salary of the government is financed by a new *sector-dependent* profile tax for companies. By including basic wages as a deduction in this tax, we minimize the money carousel. Furthermore, by registering ATR transactions twice (ATR accounts for companies and citizens), a balanced administration is created that prevents fraud. The starting point of the ATR cycle is labour participation. Where necessary, the government will mediate and support in finding an employment relationship. Someone who is out of work can return ATRs to the government and receives a basic income in return. This basic income is therefore not free money but embedded in a larger system of participation. Of course, there can also be Trade. At a special exchange, citizens who want to work less can sell their ATRs to people who want to work more. The trade price is expected to be lower than the base wage, ensuring efficient labor and income redistribution.

Labor and capital are closely intertwined. Capital is aggregate labor from the past. Rich people who 'live' on accumulated capital therefore also contribute to society. But a balanced society ensures that the individual wealth of individuals is capped, because too large differences in wealth are socially destructive. Social security and taxation must be deeply integrated into this new labor market instrument.

Working time rights create a new dynamic in the labor market and remove barriers. The ATR redistributes labor in times of scarcity and abundance. The impact on employment of new technologies, such as biotechnology, nanotechnology, artificial intelligence (AI) and the greening of the economy is unpredictable. Through the periodic distribution of ATRs, the government can provide citizens with security of work and income in *all* possible future scenarios. There is sufficient mobility and flexibility due to the tradability of ATRs. Working time rights guarantee a minimum income, reform labor market relations (the negotiations between employer and employee) and integrate social security and the labor market. By transforming ATRs into a digital coin it can be used as payment for local products. It is a means to protect the local economy from globalization. It reinforces emancipation because everyone, every gender, receives an equal amount of ATRs. The boundaries between permanent and flexible work, between white and undeclared work, between paid and unpaid work, and between regular workers and workers with disabilities will blur and countless new types of employment relationships will emerge. ATRs can be put to good use for circular labor migration. At the lower end, the basic wage prevents exploitation. Multi-year contracts offer certainty

but also guarantee migrants will return. In the High Tech sector, with high salaries, ATR and basic salary are not relevant (An employment relationship can of course still be entered into without ATR transactions, but because the basic salary expires, the employer will have higher wage costs, and/or the employee a lower salary) but the profile tax for the company and the capital growth tax for the employee will set limits. It is of great importance that the ATRs, in combination with the right tax authorities, will encourage companies to become more social and also to involve the people who are currently 'on the sidelines' in the labor process.

Education time rights

We cram too much economy into the Netherlands. We have to make choices[vi]. But before the Netherlands sets up a new industrial policy, we will have to have a better grip on the labor market (ATR) and especially on the most important factor in the development of the labor market: education. I propose that we introduce a Cap *without* Trade in education: education time rights. Educational time rights are intended to stimulate the consumption of education and to reform the education system of the Netherlands. Countless policy changes, system changes, and regulations have completely encapsulated the human process of teaching. Let's get back to the core: creating a relationship between teacher and educator and creating an education system that facilitates that relationship as much as possible.

In 2020, the Borstlap Committee proposed that every citizen should receive a 'personal learning account'[vii], a budget for an 'education permanente'. I am arguing here for a time right and not for a financial budget. Moreover, I think it is an explicit task of the government and not of the social partners. A time right of 1 hour of education does come with a budget for the education company, but this is not linked to the nature of the knowledge, the learning or teaching material that is transferred. 1 hour of quantum mechanics lesson should be worth as much as 1 hour of flower arranging because the goal is to increase educational participation, where everyone must have equal opportunities. The time right system is also simpler and more transparent. The government gives everyone from the age of 17 (after the compulsory education period) an equal amount of learning rights (LTRs). LTRs can be exchanged at existing educational institutes but also at new educational companies to be set up.

The motto of the new system must be to liberate the educational relationship and allow 100000 teachers to flourish. The starting point is 'Anything goes'. Everyone is allowed to teach: no teaching qualification required. Anyone can start an education company: no permit of the government is required. The government facilitates the accommodation with multi-tenant buildings in which educational companies can rent premises (at commercial or social rates). The new education companies have 3 sources of income. The budget associated with LTRs that is transferred when an educational activity takes place. To diminish the money carrousel, it can be transferred in the form of a deduction

on the profile tax. The second source of income is tuition or tuition fees, which can be freely determined by the education company. The third source of income is result bonuses. These are outflow bonuses, which education companies receive when students obtain a diploma and/or teaching credits. Assessment of educational results of companies is carried out exclusively by independent testing companies. It is important that testing companies publish the results of education companies in a public register that can be viewed by all education applicants.

Learning time entitlements encourage greater knowledge intensity and a faster upgrade of work, which is necessary for the new technologies and the greening of the economy. It will gradually make the educational infrastructure more flexible. The new education company can make a profit with innovative teaching practices, the quality of teachers, the reduction of class dropouts, aiming for high inflow, or high outflow, etc. etc. There will be a great diversity of education companies that fill niches and provide tailor-made solutions. Teaching qualification is no longer compulsory but will always be an important quality guarantee in the game of supply and demand. Good teachers will earn more, bad teachers will earn less. The 'consumption' of learning time rights by 'learners', the basic wages of teachers and the renewal of the system will systematically increase educational participation and employment in education. It will give a new impetus to education and eliminate the major shortages in de education sector.

Technology and privacy

Finally, Cap and Trade requires technologically advanced solutions, which are widely available today, but were completely unthinkable 30 years ago. Transactions with ATR and LTR are as easy to handle as a ride on the bus: check in and check out. Carbon rights and transport rights are becoming new digital currencies with which we pay for petrol, gas and meat and a car ride. At the Dutch Central Bank, every citizen receives new digital accounts for labour, education, CO2 and transport. These innovations will strengthen social cohesion and reduce polarization. Of course, this technology creates a colossal amount of transaction data, which automatically raises the question of the risks of fraud and the danger to privacy. And here, too, the solution is a new technology: a blockchain. We use a blockchain to register transactions in a decentralized transparent manner. The transactions can only be traced back to individuals via a Digital Identity (DID). All citizens are the owners of their own transaction data and (apart from legal requirements) can decide for themselves which third parties have access to which data, whether or not anonymized.

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[i] A difference analysis between 'levies' and 'cap and trade' can be found https://fastercapital.com/nl/inhoud/Cap-and-Trade-versus--CO2--prijzen--welke-aanpak-is-effectiever.html

[ii] Read for example: Who owns the sky? Peter Barnes, Islands Press 2001

[iii] https://www.youtube.com/watch?v=Buxww3R3RdE

[iv] https://www.nrc.nl/nieuws/2022/08/05/een-co2-budget-voor-burgers-in-theorie-niet-echt-dom-maar-implementatie-is-waanzinnig-a4138288

[v] In an interview with the Correspondent you can hear that Barbara Baarsma thinks division is only a *second best* solution; according to her, the best solution is pricing.

[vi] According to Marieke Stellinga in https://www.nrc.nl/nieuws/2024/04/19/we-proppen-te-veel-economie-in-nederland-maar-hoe-kies-je-wie-moet-inschikken-a4196597

[vii] https://www.rijksoverheid.nl/documenten/rapporten/2020/01/23/rapport-in-wat-voor-land-willen-wij-werken