

# Cap-and-Trade: How it Works and Why it Fails

A literature review on the performance of global carbon markets

Bachelor's Thesis  
Jenna Tiainen  
Aalto University School of Business  
Department of Economics  
Summer 2019

<b>Author</b> Jenna Tiainen		
<b>Title of thesis</b> Cap-and-Trade: How it Works and Why it Fails – a literature review on the performance of global carbon markets		
<b>Degree</b> Bachelor of Science		
<b>Degree programme</b> Economics		
<b>Thesis advisor(s)</b> Murto, Pauli; Mustonen, Mikko		
<b>Year of approval</b> 2019	<b>Number of pages</b> X	<b>Language</b> English

#### Abstract

Objectives  
Summary  
Conclusions

**Keywords** keyword, keyword, keyword

## Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>4</b>
1.1	Research Question .....	5
1.2	Research Objectives .....	5
1.3	Key Concepts .....	6
<b>2</b>	<b>Trading Systems.....</b>	<b>6</b>
2.1	The Kyoto Protocol.....	6
2.1.1	<i>The Clean Development Mechanism</i> .....	6
2.2	The EU Emissions Trading Scheme.....	6
<b>3</b>	<b>Findings.....</b>	<b>6</b>
3.1	Problem of Non-linearity.....	6
3.2	Problem of Price Volatility .....	6
3.3	Problem of Strategic Gaming .....	7
3.4	Ethical Issues (conflicts, leakage, moral hazard, additionality) .....	7
3.5	Vielä? .....	7
<b>4</b>	<b>Discussion.....</b>	<b>7</b>
4.1	Conclusion .....	7
4.2	Limitations and Further Research .....	7
<b>5</b>	<b>References.....</b>	<b>7</b>

# 1 INTRODUCTION

[[The scientific discovery of global warming and its long-term consequences begun in the 1950s when suspicious changes in the nature started to emerge (Weart 1997). A few scientists had noticed an increase in the amount of carbon dioxide particles in the atmosphere and a simultaneous rise in the average temperature of Earth. The interest towards studying “the greenhouse effect” more deeply had emerged. (lähde) It is a process where various greenhouse gases (GHGs), such as carbon dioxide, methane and nitron dioxide, gather into the atmosphere and together with the Sun’s radiation cause warming of the Earth (lähde). Research in the mid 1950s indicated that the most relevant GHG concerning the climate change is carbon dioxide so it became the central of the focus (Eriksson 1954).

Some of the most significant early research in the topic was conducted in California by Charles David Keeling, who developed a curve diagram (figure 1) to measure CO<sub>2</sub> concentration levels over the years. He was one of the few scientist to discover that first time in the history of Earth the level of carbon dioxide in the atmosphere had reached an abnormally high peak and continued increasing at an alarming rate. (Keeling 1998) Research on climate change activated and more evidence of its threats was shown during the next decade. (lähde) In the 1970s the US government slowly started to react on the matter and spend some more money on climate research (Hecht 2014) but not until 1980s became global warming a political issue (lähde). An Intergovernmental Panel for Climate Change (IPCC) was established in the end of the decade and in 1990 it issued its first report. ]]

→ TEE UUSIKSI, lyhennä! Esim:

1. Päästökauppa perustettiin missä ja milloin, ja miksi. Olennaisimmat markkinat (EU ETS, Kyoto Protocol). Sääntely ja tavoitteet.
2. Tutkimuksesta
3. tutkimuskysymys ja objektiivit
4. lähteistä
5. key concepts

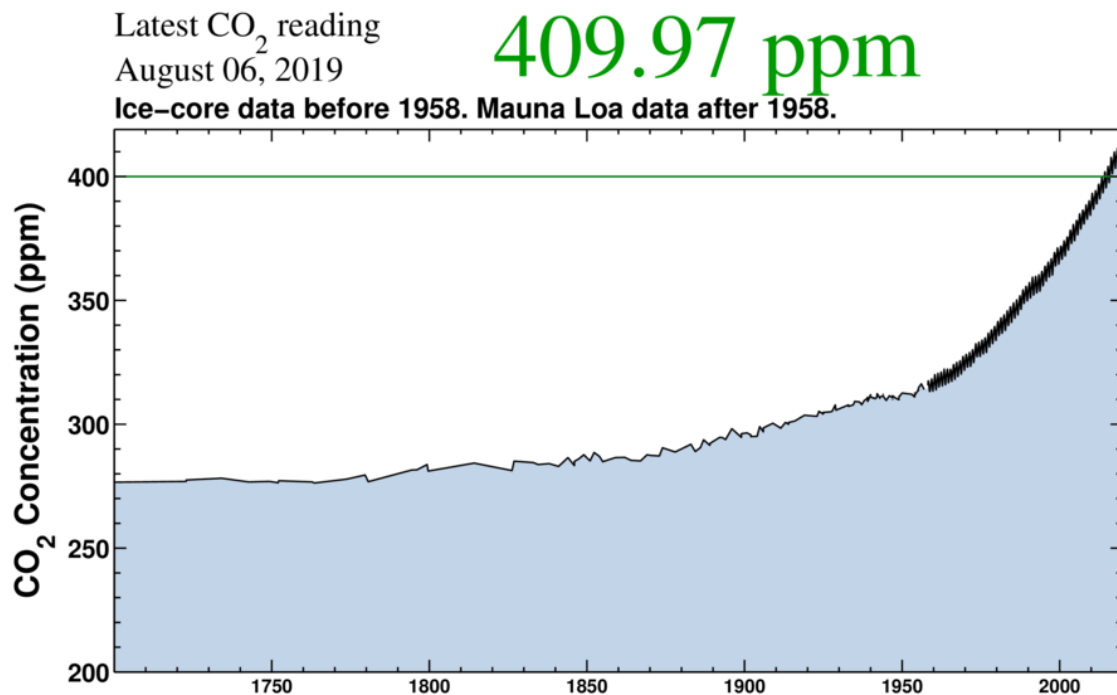


Figure 1: Keeling's curve 1700-present (Scripps Institution of Oceanography 2019)

Despite of these actions global CO<sub>2</sub> emissions have significantly grown over the past couple of decades (lähde) and in 2018 the emissions reached a new all-time high (lähde). This implies that the current policies of carbon trading are ineffective, insufficient and/or inoperative. So, how does a market designed to reduce the emissions and prevent global warming turn out to cause the exact opposite?

This study presents an overview of international carbon trading and its current challenges, from the ecological economics point of view. We begin by an introduction to emissions trading schemes, and after that continue by focusing on the critical issues of the current market.

Jatkuu

## 1.1 Research Question

[[This study aims to answer the following question:

- What are the key challenges that global carbon markets are currently facing?]] Siirrä introon?

## 1.2 Research Objectives

This study has two objectives. Firstly, it introduces the basics of international emissions trading. Secondly, it identifies the most crucial problem spots that hamper the functionality of the emissions market and prevent it from reaching its goals.

The study bases on a critical review of academic literature and recent research on [asdasd](#). It relies on secondary data sources and therefore does not offer new information but rather indentifies and summarizes the results of existing studies.

This study does *not* contemplate any specific solutions to the problems at hand. **Ei tyhjentävästi käsittele kaikkia mahdollisia haittoja ja hyötyjä ...**

### 1.3 Key Concepts

Cap-and-Trade

Carbon credit

Offset

Economic theory of emissions trading -> functionality of the markets -> public good -> a global externality (Nordhaus 1991)

## 2 TRADING SYSTEMS

Tähän introa markkinoista, economic approach

### 2.1 The Kyoto Protocol

About

#### 2.1.1 The Clean Development Mechanism

About

### 2.2 The EU Emissions Trading Scheme

About

## 3 FINDINGS

Based on a critical analysis of .... the key issues have been divided into x categories.

**ALAOTSIKOT UUSIKSI! Kategoriat: Non-Linearity, Pricing/Price Volatility, Social Justice, Strategic Gaming**

### 3.1 Problem of Non-linearity

Carbon markets are based on the assumption that there is a linear relationship between emissions and climate change, which indicates the presence of an equal, one-to-one tradeoff between the two. This means that

### 3.2 Problem of Pricing

A report issued by the OECD in 2018 states that carbon prices are significantly too low to meet their commitments on cutting emissions.

### 3.3 Problem of Strategic Gaming

About

### 3.4 Justice/Ethical Issues (conflicts, leakage, moral hazard, additionality)

About

### 3.5 Vielä?

About

## 4 DISCUSSION

### 4.1 Conclusion

Something ... the true objective of the carbon markets, NOT reducing emissions but profiting from them. The market does not incite innovations on new environmental technology. The problems are rather structural than accidental. Who benefits and who pays?

### 4.2 Limitations and Further Research

Blockchain

## 5 REFERENCES

Eriksson, Erik (1954). "Report on an Informal Conference in Atmospheric Chemistry Held at the Meteorological Institute, University of Stockholm, May 24-26, 1954." *Tellus* 6: 302-07.

Hecht, A. D. (2014). "Past, Present and Future: Urgency of Dealing with Climate Change." *Atmospheric and Climate Sciences* 4: 779-795

Keeling, Charles D. (1998). "Rewards and Penalties of Monitoring the Earth." *Annual Review of Energy and the Environment* 23: 25-82.

Nordhaus, N. D. (1991). "To Slow or Not to Slow: The Economics of The Greenhouse Effect". *The Economic Journal*. Vol. 101, No. 407 (Jul., 1991), 920-937.

Weart, S. R. (1997). "Global Warming, Cold War and the Evolution of Research Plans." *Historical Studies in the Physical and Biological Sciences* 27(2): 319-356.

UNFCCC [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol)

Kuvat/kuvaajat

1. Scripps Institution of Oceanography (2019). “Keeling’s curve”. Accessed 8 August 2019.  
<<https://scripps.ucsd.edu/programs/keelingcurve/>>