

Financing CCS

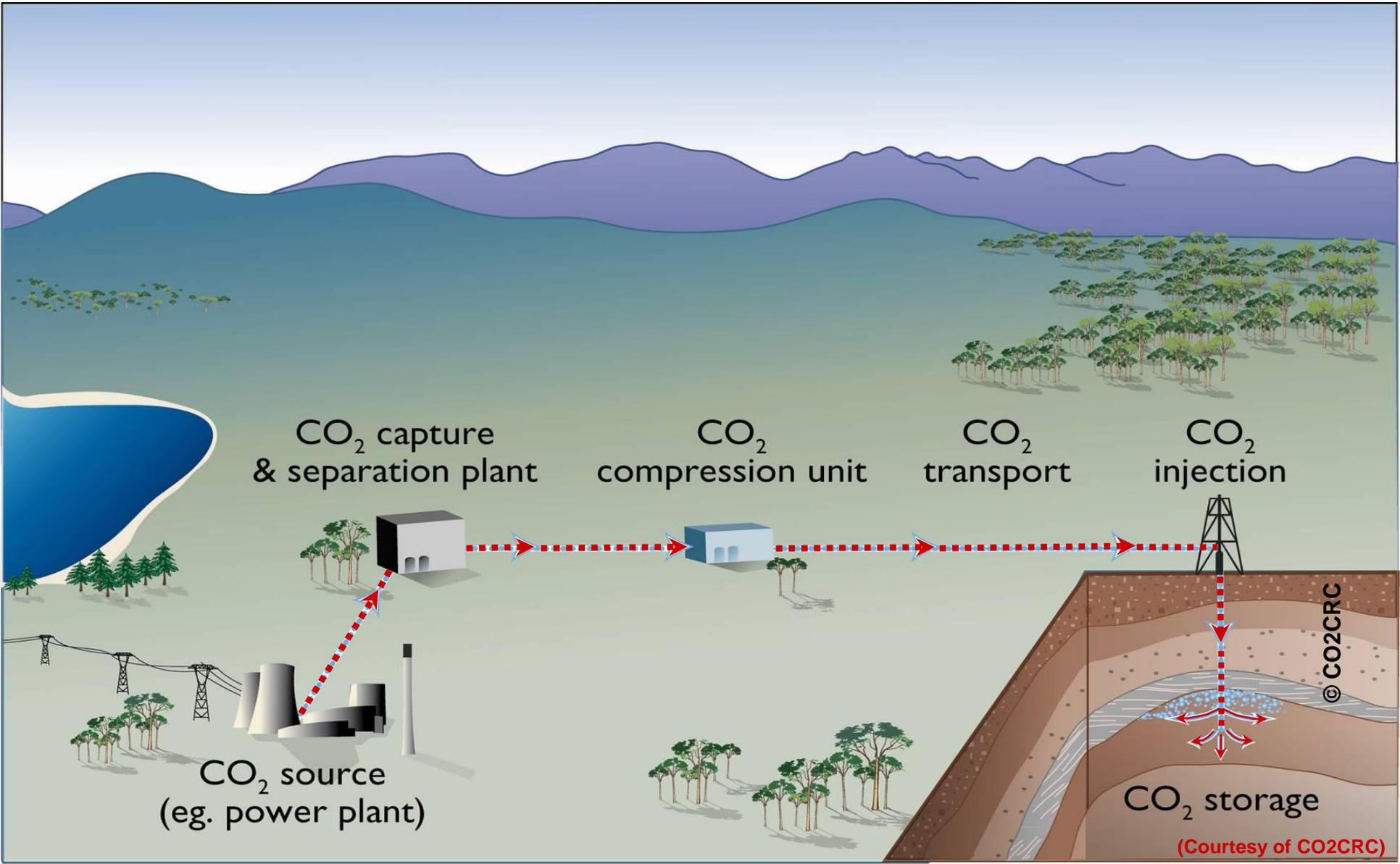
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on Greenhouse Gas Emission Trading
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Outline

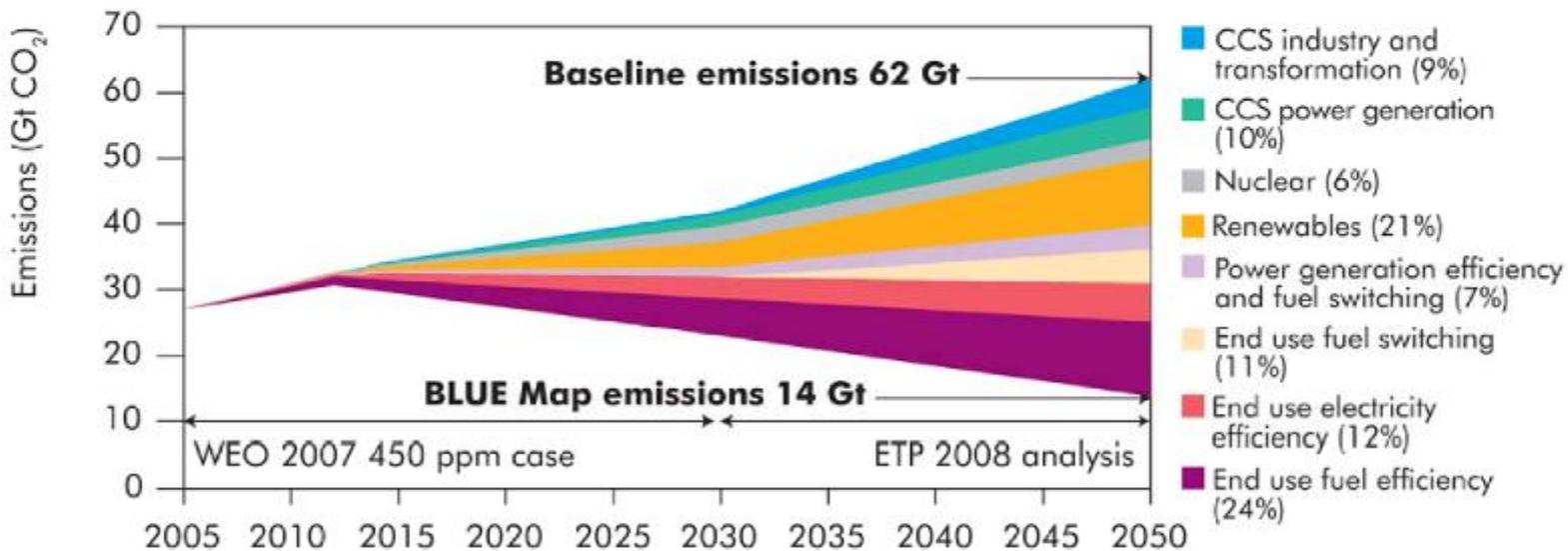
1. CCS as option for climate change mitigation
2. The challenges to make the option become reality
3. Financial instruments available for CCS deployment
4. The state of the play – what is going on
5. What is needed

Carbon Capture and Storage (CCS): Transforming fossil energy use.



CCS has a profound role in global CC mitigation

Contribution of emission reduction options, 2005-2050



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Scenarios &
Strategies
to 2050

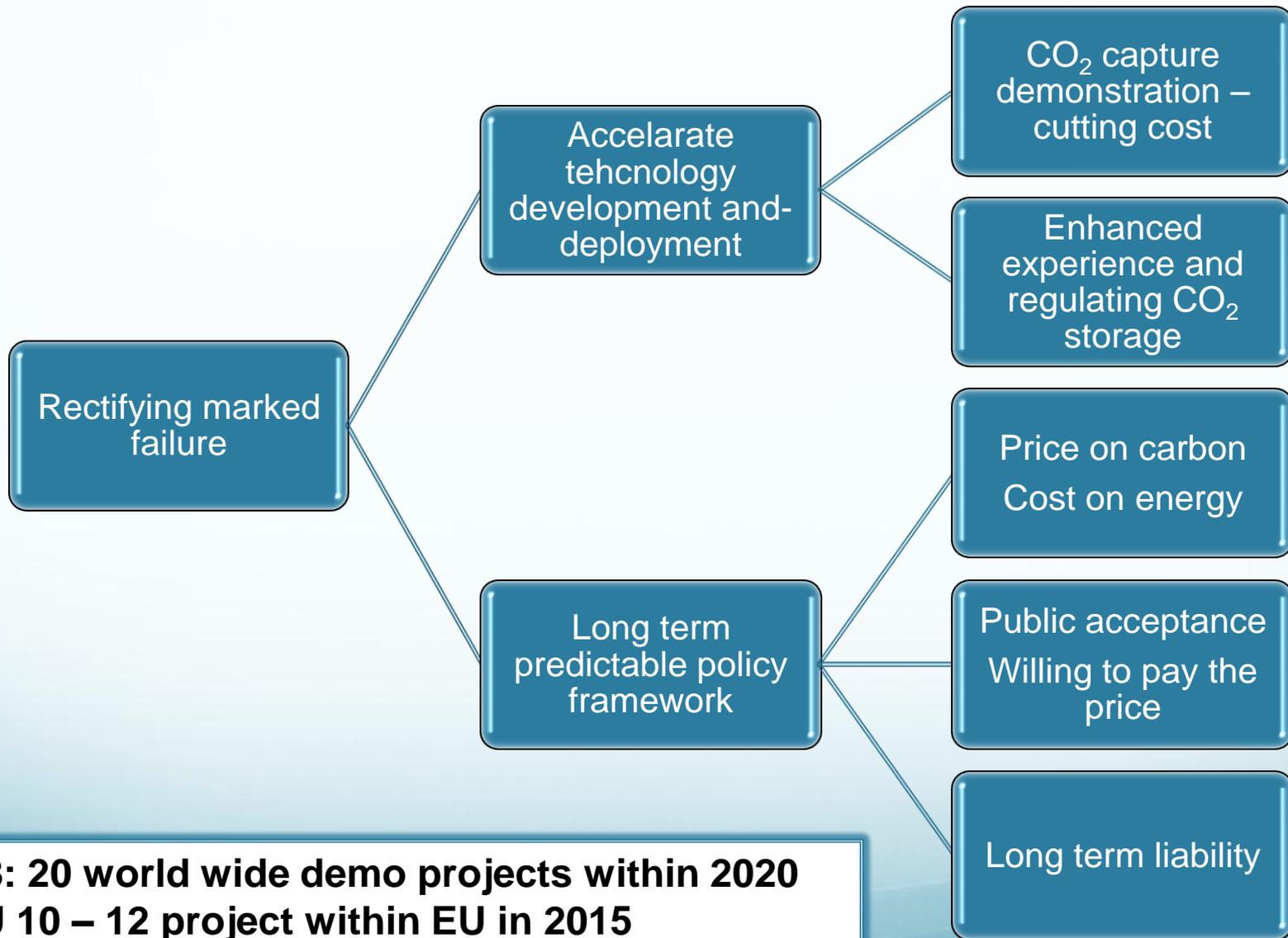
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A successful demonstration phase needed for global industrialisation and deployment of CCS



G8: 20 world wide demo projects within 2020
EU 10 – 12 project within EU in 2015

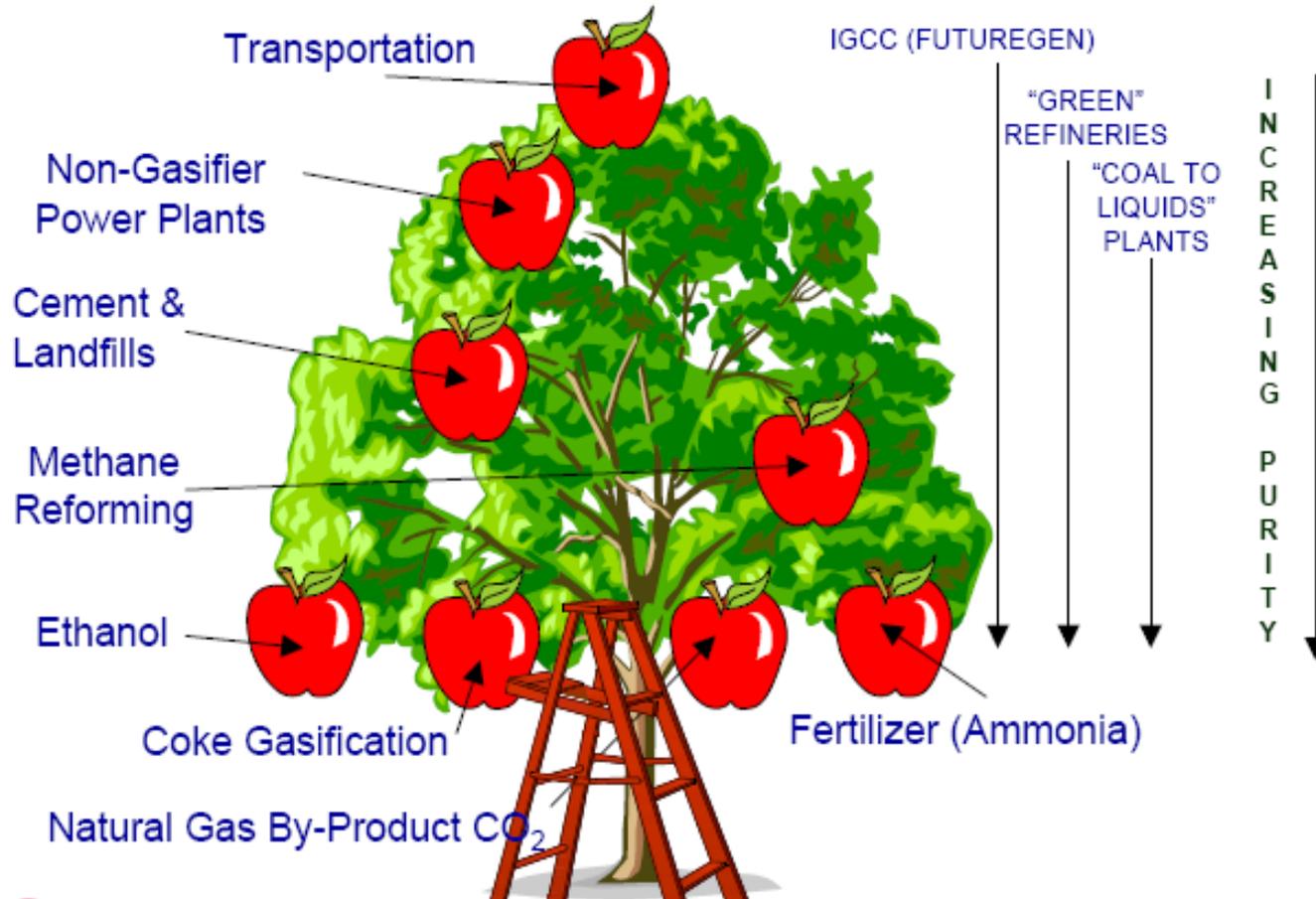
Findings from IEA report on CCS to G8 (1)

- ✓ CCS leads to substantial increase in capital and operating expense combined with decrease in plant efficiency
- ✓ The cost of CO₂ transport to storage can be high, and have doubled over the last decade
- ✓ A 20 demonstration projects are needed to bring down cost and enhance experience, and to gain public acceptance if CCS are going to make a meaningful GHG mitigation contribution by 2030
- ✓ Regulating the long term liability need to be addressed and the financial and insurance industry must be engaged

Findings from IEA report on CCS to G8 (2)

- ✓ Market based solutions alone will be insufficient to finance the early demonstration projects.
 - Will need governmental funding along with the private sector
 - Schemes to mitigate risk for early adopters
- ✓ Medium and long term viability of CCS will be enhanced by inclusion of CCS in the Kyoto Mechanisms and EU ETS
- ✓ The scale and investment required for CCS RD&D and the projected growth in Non-OECD countries makes international cooperation vital

The low hanging CO₂-fruits tree



All currently operating CCS are related to oil and gas activities
CO₂ tax the major driver for Sleipner and Snøhvit in Norway

CCS in Emission Trading Schemes

Systems	Supporting mechanisms	Issues
EU ETS <i>Phase II</i>	Stored CO ₂ not accounted for as emissions	<ul style="list-style-type: none"> •Opt in option for phase II •Demonstration projects need additional financial incentives
<i>Additional for Phase III</i>	Credits for stored CO ₂ , - but limited to part of new entrance reserves	<ul style="list-style-type: none"> •How big part of NEW to CCS? •Different views between MS •EP proposal 02.10
<i>Demonstration projects</i>	Allocation of auctioning revenue by EC	EC: 20% of auctioning revenue to be allocated CC tech, including CCS
	Allocation of auctioning revenue to be decided by the MS	<ul style="list-style-type: none"> •Fragmentation of community effort •How to control fulfilment of EU program?
USA <i>Warner-Liebermann Bill</i>	Bonus allowances to CCS	Proposal failed to proceed to Senate vote.

(Some) Initiatives on fiscal support and public ownership

Countries/ regions	Supporting mechanisms	Issues
EU	Capital to community infrastructure?	A possible option? Political acceptance?
UK	Funding via competition for 300-400 MW demo CCS plant	In process
Norway	Ownership in CO2 test centre, Mongstad at CHP gas plant	Gvm guaranty for capture and storage. State company operator
US	President's Clean Coal initiatives: \$2 bill support over ten years	No projects at commercial scale yet, except for FutureGen. Substantial engagement
Australia	\$40 million demo-project with support 7 gvm agencies in addition to 15 companies	Other initiatives in the pipeline
	§ 100 (Aus) to CCS competence centre + § 100 in annual support	Covers both capture and storage. Regulatory in front.
Canada/Alb erta	§ 2 bill (Can) from Alberta gvm allocated to CCS technology development	Several private – public initiatives in process

Financial mechanisms within international CC regimes possible incentives for CCS

Financial instruments	Supporting mechanisms	Issues
CCS as CDM in current regime <2012	Credit for net emission reduction	Decisions at CMP 14? Probably negative
CCS/JI as CDM post 2012	Credit for net emission reduction	On the agenda for AWG KP Still political opposition
Sectorial CDM	Credits for CCS within the power sector?	How to benchmark with power plants without CCS
Sector crediting of emissions reduction bellow <u>no-loos target</u>	Deployment of CCS could be basis for credit	Norwegian grant to Brazil for deforestation based on this model. Can credits be accounted for?
Crediting for over fulfilment of predefined <u>national mitigation action</u>*	Could give incentives for CCS in NA1 countries	Who should pay? Can credits be accounted for, or pure fiscal support (Auctioning revenue)
Trading of credits based on <u>sector targets or NAMAs</u>*	Incentives determined by carbon price. CCS controlled by national permits	MRV important both at installation and national level
International funding for <u>technology transfer</u>	Financial source – auctioning revenue	Proposed by some countries – How can CCS benefit

Summing up

Several initiatives world wide to drive demonstration of CCS

- ✓ **Legislation**
- ✓ **Financial incentives**
- ✓ **Public engagement**

Doubts about the public efforts is large enough to engage the private sector at a scale and a pace needed to meet the political objectives

Financial instruments as part of an international climate change are targeting all mitigation options. How these could facilitate CCS need to be examined along with the design of the instruments

Much work is needed to substantiate, to enhance understanding, build capacity in NA1 countries and to build consensus globally.

Predictable capital availability is an issue.

Need to think outside the box. Auctioning revenue generated as part of a CC mitigation regime should be used for CC purposes