



Proposal for [Global plan](#) by [crcsolutions.org](#)

Global 4C: Empowering Humanity for Carbon Transition with Smart Money

DESCRIPTION

MODEL RESULTS

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Global 4C Mitigation: An International Currency Protocol to Protect the Earth's Climate and Biosphere.

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Description

Summary

PROPOSAL SUMMARY

Global 4C: Empowering Humanity for Carbon Transition with Smart Money

Team Proposal: Only team members will be able to edit this proposal.

By: [crcsolutions.org](#)

Contest: [Global plan](#)
What combination of actions can be taken in the world as a whole to address climate change?



Figure S1. *Global 4C Mitigation* proposes a fundamentally new course for political leaders and society to meet the challenges of climate change by advocating globalized rewards for greenhouse mitigation and sequestration. It is believed that this proposal for a 4C international digital currency system is rational, politically feasible and urgently needed as a new 'social agreement' to protect the Earth's climate and biosphere for future generations.

[g4Cm.org](#)

> [U.S. & Land](#)

Humanity is stressed by an economic system that facilitates the concentration of wealth, depletion of resources, and the degradation of ecosystems. To mitigate two great environmental threats - climate change and species extinction - we developed a plan called *Global 4C* for reducing greenhouse pollution. This plan is intended for government consideration in international negotiations on climate and economic policy. It proposes '4C' as a mitigation reward and newly minted currency. The 4C will be offered internationally for GHG emissions reductions, cleaner energy, and sequestration according to rules for net benefit. Bio-sequestration that also protects biodiversity can be rewarded on a statistical basis.

The price signal of 4C will combine with that of co-existent carbon taxes, and so 4C is a

macro-economic instrument that creates a stronger mitigation response. Civilization has a bias for energy surplus to maintain economic growth and social stability [6,7]. This plan avoids direct conflict with the politics of growth by offering rewards as a financial incentive. The key advantages for governments will be a new capacity to leverage mitigation by coordinating monetary policy and raising 4C exchange rates. Hence 4C serves multiple purposes: it becomes an international trading currency, it complements co-existent taxes, and it finances mitigation projects.

The carbon tax is known as the “price on carbon”, and 4C will be known as the “reward for carbon”. The 4C currency has the technical name *Complementary Currencies for Climate Change (4C)* and a *unit of account* of 100 kg CO₂-e mitigated or sequestered for at least 100 years (Fig S2). The 4C will be issued to enterprises as currency with digital contracts to enforce conditions regarding verifiable duration. Demurrage will be used to account for mitigation defaults. The marginal cost of administration will fall steeply with new technologies for digital communication, networking and environmental sensing.



Figure S2. *Complementary Currencies for Climate Change (4C)* is a proposed financial reward for mitigation and international currency rolled into one. The 4C will be supply-pegged to the total mass of greenhouse gases mitigated and sequestered. The equilibrium price of 4C will be programmed to rise for the remainder of the 21st century via strong institutional support, including international agreements for monetary policy and trade. This is a proposal for governments to use the power of the global economy to avoid dangerous-to-catastrophic climate disruption. It will also herald a new era of monetary science and ethics.

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Category of the Action

Integrated action plan for the world as a whole

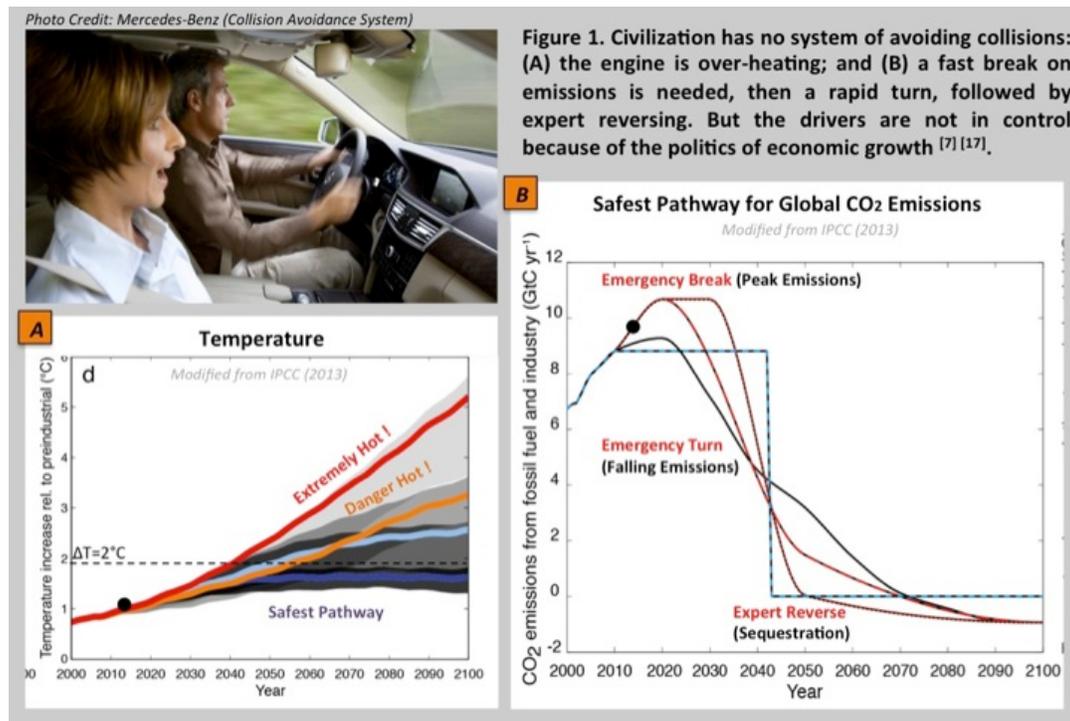
What actions do you propose?

The objective is **deep de-carbonization** to achieve a CO₂-e peak of 450 ppm and then sequester to below 400 ppm by 2100. We propose that Global 4C will achieve this by complementing any existing tax policies (e.g. Fee & Dividend) and additionally by providing global price coordination, reduced political conflict, funds for sequestration, and data collection for planners.

If fossil fuels and forests continue to be the feedstock of growth, then overshooting the 2°C

'danger line' of the Copenhagen Accord is **certain**. Energy Return on Invested (EROI) is falling and civilization is on a collision course with **+4°C by 2100**, species extinction, and "... *unprecedented heat waves, severe drought, and major floods*" [1]. Stabilization pathways RCP4.5 & 6.0 are also very dangerous (+2.4-3°C). If civilization were a car we could say that it's moving too fast and the engine is about to over-heat (Fig 1A).

An early emissions peak (Fig 1B) appears unattainable, in part because strong carbon taxes are politically vulnerable. The most immediate problem is that leaders don't have economic tools that can be used to leverage mitigation and simultaneously provide positive incentives.



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If the world's governments wish to establish a coordinated and enduring mitigation agreement, they will need an economic tool that avoids political conflict especially during economic down-cycles and crises. Global 4C could satisfy this need by allowing all governments to coordinate their trading in a single foreign exchange market for 4C (Fig 2C). Governments could exchange currency reserves or use quantitative easing (QE) to buy 4C in a manner akin to debt de-leveraging [15,16]. An international protocol for these transfers could be designed to be partly autonomous so that the 4C exchange rate can rise smoothly for 100 years and meet an agreed mitigation target. Wealth would be transferred via 4C directly to the enterprises that can verifiably mitigate and sequester.

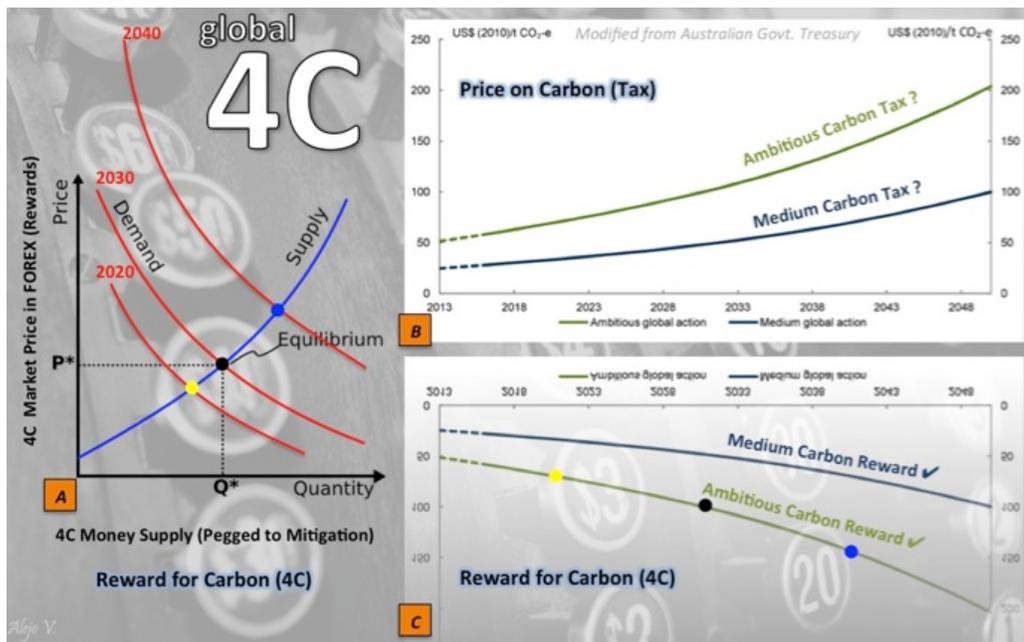


Figure 2. Global 4C financial rewards for mitigation: (A) Supply-demand curves showing that the quantity of mitigation and 4C money supply increase when governments sponsor 4C demand; (B) raising carbon taxes over 50-100 years will face political challenges; (C) Global 4C rewards, on the other hand, will attract less political conflict. Rewards and taxes could also rise in tandem, since they are complementary policies.

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Bill McKibben hopes for a “*fundamentally new course*” [8] but an international consensus on strong taxes has so far been elusive. We should not be surprised by this, however, because carbon taxes threaten the economic growth of politically influential groups. Such groups may influence entire countries:

“We seek to deal with (climate change) in a way that will protect and enhance our ability to create jobs and growth — not destroy jobs and growth in our countries” -Stephen Harper [9,10]

Mitigation policies are usually (1) regulations, (2) a price on carbon, or (3) direct action. Global 4C will set a price on carbon as a reward, not a tax, and will deliver the reward as newly minted 4C currency. This approach is adopted so that currency trading and monetary expansion can be used by governments to finance the rewards for mitigation and sequestration. The plan is to invite G20 nations to sponsor the 4C for 100 years so that the 4C price can rise and motivate enterprises (in participating nations) to mitigate emissions and sequester carbon (Fig 2C).

This is the existing socio-economic principle for carbon taxes:

Polluter Pays Principle (PPP): Polluter pays the social costs of GHG emissions to society as a fee or tax.

These are three new principles for 4C rewards:

Society Rewards Principle (SRP): Society pays the social benefit of GHG mitigation & sequestration to enterprises that mitigate & sequester (4C sponsorship costs will be diffused across the global economy and may go largely unnoticed)

People Cooperate Principle (PCP): A complementary combination of rewards (SRP) and penalties (PPP) yields the most cooperation from people. This is proven for individuals [5]; and it applies to business decisions based on taxes and rewards.

Globalized Intrinsic Value (GIV): Currencies that are designed to mitigate dangerous global environmental threats (e.g. climate change) will have intrinsic value that is globalized and so

deserve international recognition.

All sectors of the economy can be rewarded (Fig 3). Unease with the SRP will arise if (Class 1) heavy industry can gain twice: once when polluting and again by receiving rewards for mitigation. Rewards for industry with a history of heavy pollution may have their rewards diverted to a *Public Trust*, depending on the price signal, cost-benefit analysis and social preferences.

The other classes are:

(Class 2) domestic, light industry, transport & agriculture based on a 'carbon intensity reduction' rule;

(Class 3) power suppliers in markets based on a 'cleaner power' rule; and

(Class 4) sequestration based on 'net carbon stored' and 'bio-diversity protection' rules.

Global 4C can begin by rewarding (Class 2) families and (Class 3) power markets to establish a broad user base and to test verification systems. A priority will be (Class 4) [bio-sequestration with improved land-use management](#) in rural communities. Class 4 micro-rewards can be sent by mobile phone and Internet, and amounts will be determined by geo-statistics, ecological modeling and satellite imagery.

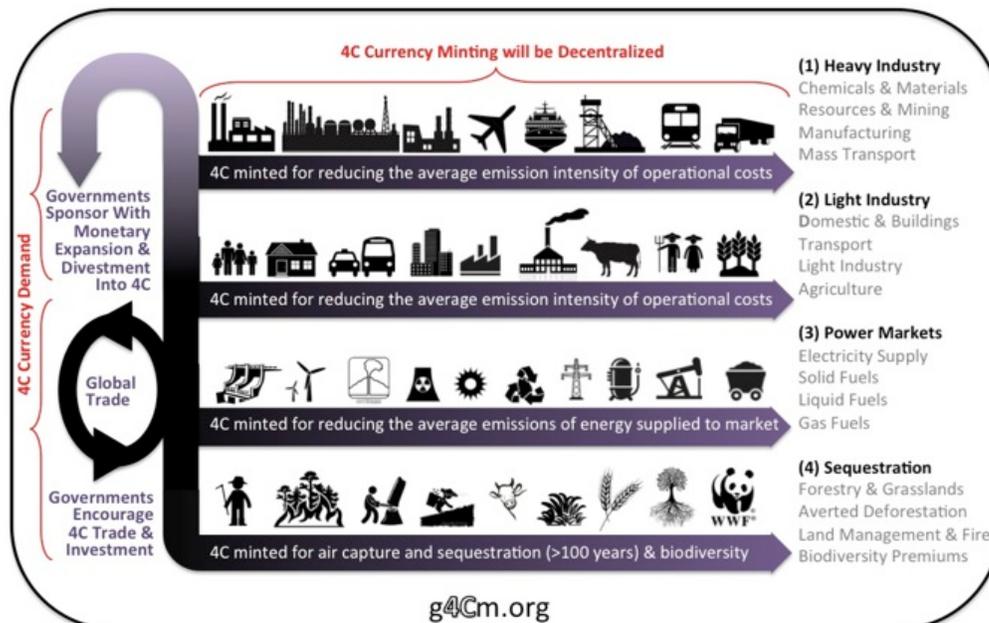


Figure 3. Global 4C rewards will be managed with four classes: (2) rewards for individuals, families and light industry based on historical emissions intensity of operational costs; (3) rewards for power suppliers in power markets based on average emission intensity of both supplier and the market; and (4) rewards for all types of sequestration based on net GHGs captured from ambient air and stored for >100 years. The class (4) will include premiums to protect biodiversity. Class (1) rewards for heavy industry may be subject to social cost-benefit analysis to determine if they should be held in *Public Trust*.

Where will these actions be taken?

POLICY STUDY: The study will be international and collaborative because the objective is a new international currency system for mitigation. The current policy host is www.crcsolutions.org, located in NJ, United States, but our team is international, with representation from United States, Holland, Australia, Canada, India, Serbia, Finland and other countries. Sponsorship will be sought

internationally. The economic study and a policy white paper for *Global 4C Mitigation* will be developed collaboratively, but the working language is English.

ADVOCACY: After completing the policy study, we will seek support from climate scientists, economists and policy makers from many nations. Advocacy will then focus on the international institutions and high level officials in the United States, China, European Union, and other G20 nations.

IMPLEMENTATION: For governments to begin Global 4C negotiations, a [framework of five 4C host countries and one host institution is suggested](#). These could be the United States, China, European Union, India, Switzerland, and the United Nations. A starting point for negotiations could be the [five-currency system presented in our sub-proposal](#). This system can be managed and delivered by the host countries (prices of different 4C will tend to equilibrate in a common market).

REWARDS: Class 1, 2, 3 and 4 rewards would be offered to all sponsor nations. Class 4 rewards will be offered for storage of GHG for a period of >100 years and using any lawful technology: [BECCS](#), [bio-char](#), [CCS](#), [electrolysis](#), [mineral carbonation](#), ocean storage, etc. Class 4 rewards will be offered for bio-sequestration in non-sponsor nations, such as in Africa, SE Asia and South America, where significant amounts of GHGs are produced by land degradation, deforestation, logging, fire, mono-agriculture, over grazing, urbanization, desertification, etc.

Who will take these actions?

OUR TEAM: Our team of volunteers includes people at the [crcsolutions.org](#), 8 PhD economists, 1 PhD civil engineer and 3 student interns. The first paper will explain the macro-economic theory and social equity issues as they relate to the use of complementary currencies for correcting market failures in public goods and services. A 100+ page technical report defining the Global 4C Mitigation rules is available to sponsors and partners.

People who can respond to sponsors and partners are listed here: [www.g4cm.org](#), and includes:

[Jonathan Cloud \(Executive Director\)](#) jcloud@crcsolution.org

Center for Regenerative Community Solutions (CRCS) and New Jersey PACE 501c3 non-profit Organization, NJ, United States

[Theresa Carbonneau \(Strategic Business Consultant\)](#) tcarbonneau@mac.com

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[Joel van der Beek \(Community Sponsor\)](#) info@econovision.nl

EconoVision, Economic Research & Advice, The Netherlands

What are key benefits?

GOVERNMENTS: i) ability to leverage mitigation without taxes, ii) more currency liquidity in global trade, iii) improved social equity, iv) globalized data capture, v) direct causality between prices and mitigation, vi) policy longevity, and vii) good governance (Figs 4 & 5).

INDUSTRY: Offered rewards to reduce emissions based on average carbon intensity of operational costs. 4C prices allow long-term planning.

PUBLIC: Social cohesion and investment options (Fig 6). Communities will benefit from bio-sequestration and improved land management. Global 4C creates an education portal & complements other programs.

INVESTORS: A government sponsored bull market in 4C will yields a return. IPCC advice on 4C targets feeds back on prices. Micro-finance will reach places where banking is expensive.

POWER SUPPLIERS: Suppliers are rewarded by the pollution they offset (Fig 7). 4C complements the carbon tax, invites innovation, and does not reward heavy polluters. Rewards sunset at 100% of market share.

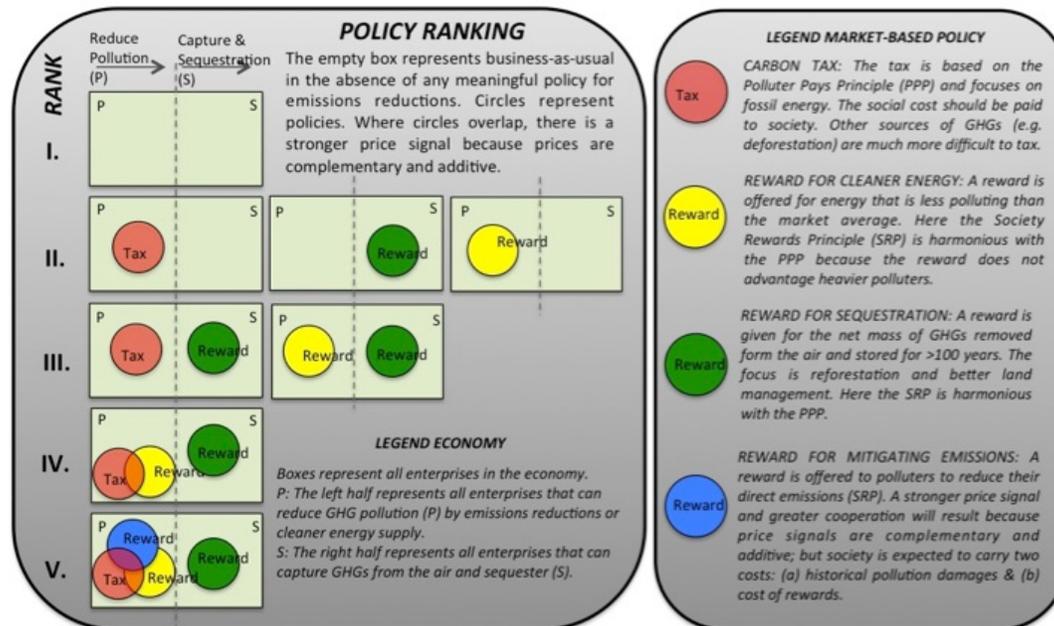


Figure 4. Ranking of different market-based policy combinations for creating price signals and mitigating climate change: (red circle) carbon tax and its variants such as the ETS; (yellow circle) reward for substituting dirty energy with cleaner energy; (green circle) reward for air-capture and sequestration with a focus on forestry and land use; and (blue circle) reward for reducing direct emissions by families, light industry, and agriculture, but potentially involving all sectors in the economy.

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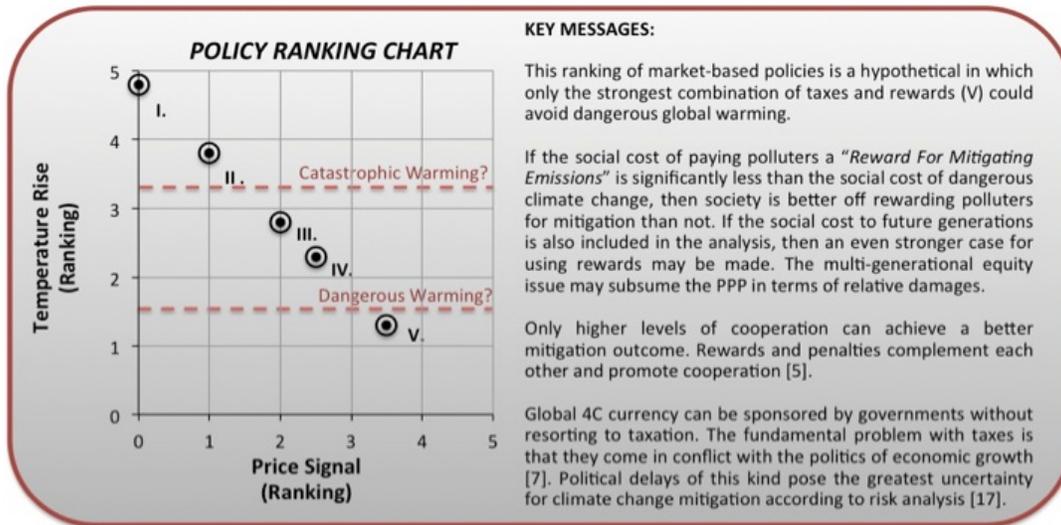


Figure 5. Hypothetical ranking of different combinations of market-based policies for mitigating global warming. Notice that the strongest price signal is created when the full combination of taxes and rewards are implemented. The massive bio-sequestration and CSS that will be needed to avoid 2°C warming (IPCC, 2013 & 2014) suggests that a strong price signal across all types of sequestration will be needed.

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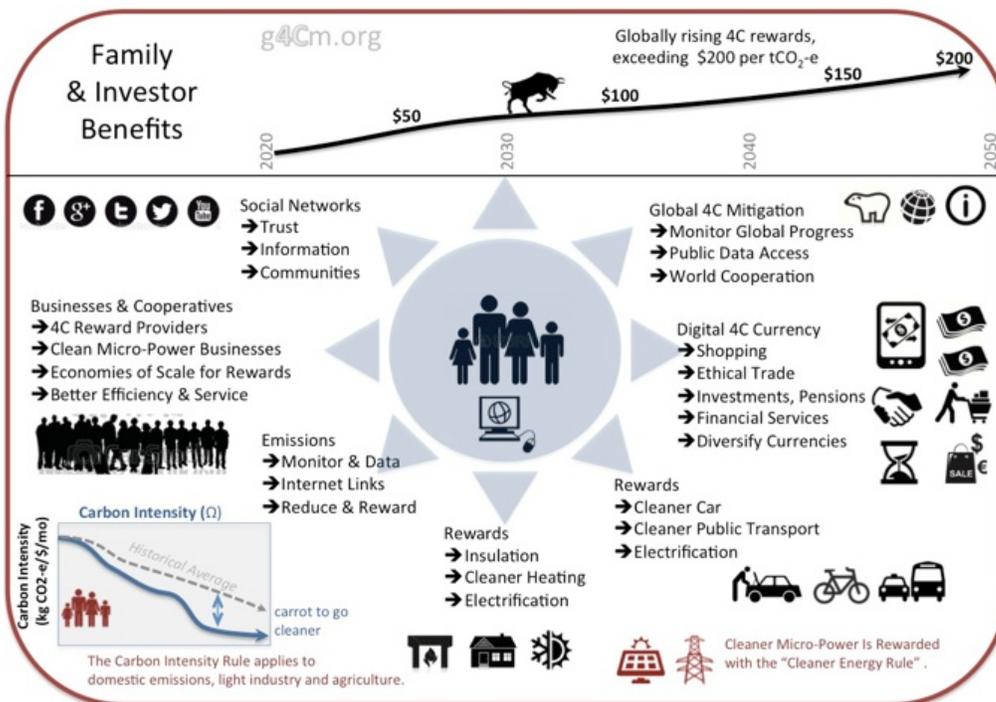


Figure 6. Global 4C rewards will offer multiple benefits for individuals and families in participating nations, including ability to earn rewards, diversify currency, access information, and invest in bio-sequestration and cleaner energy. The 4C system will be decentralized, social, and supportive of mitigation trade and projects.

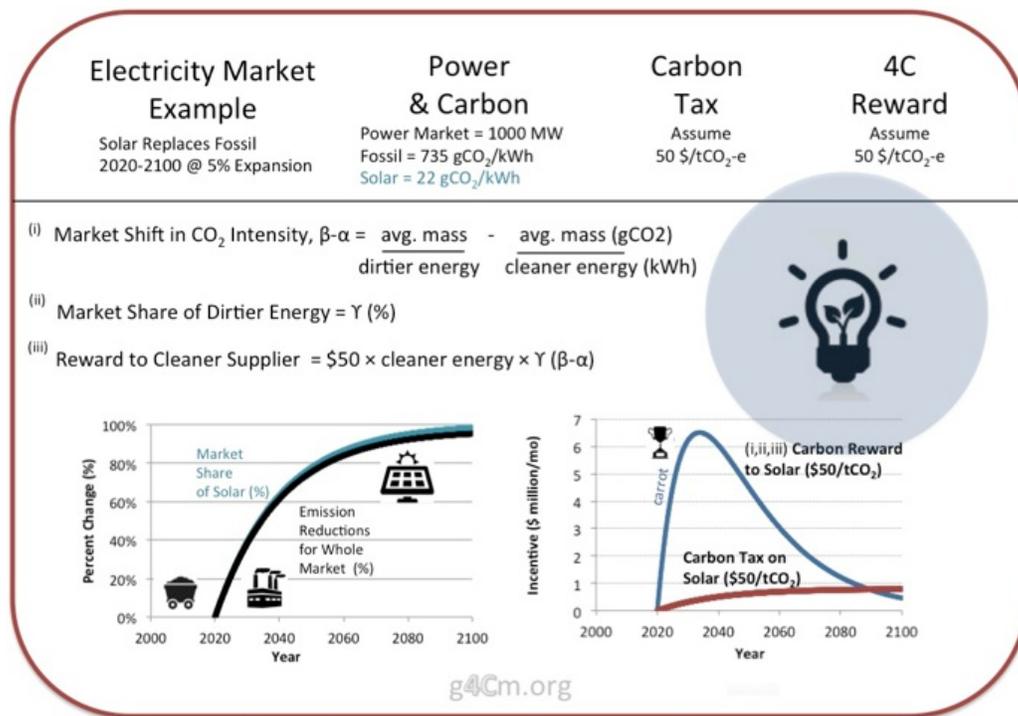


Figure 7. An example showing how the “Cleaner Energy Rule” provides long-term financial incentives to cleaner power suppliers in markets and without benefiting suppliers with historically heavy pollution.

What are the proposal’s costs?

STUDY: Economic study is \$0.75 -1.0 million USD with private and public partnering.

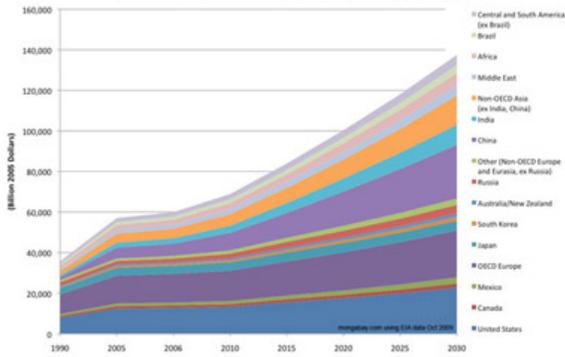
ADVOCACY: In kind with partners and sponsors.

OPERATION: The [marginal cost for data](#) collection & verification will fall rapidly with the emergence of the ‘[internet of things](#)’.

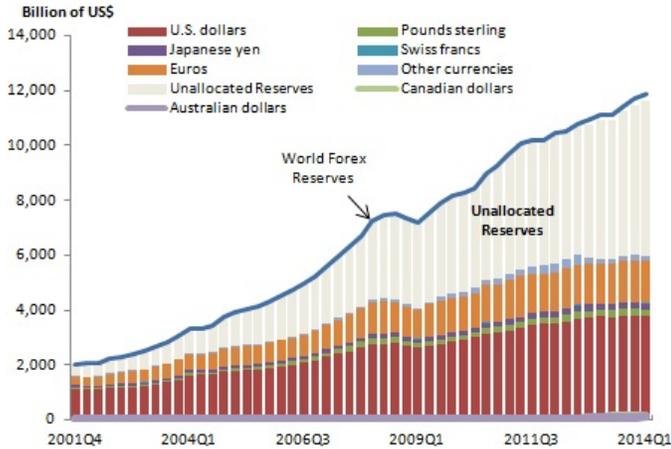
ABATEMENT: The global abatement cost for [de-carbonization](#) to 450 ppm CO₂ (<400 ppm by 2100) is roughly 3.1% of GWP ([Tyndall Centre, 2006](#)). The cost to markets will include a [\\$20 trillion fossil asset write down](#). Investment of about [\\$48 trillion will be needed for new energy by 2035](#).

CONCLUSION: Carbon can be globally [deleveraged](#) with rising government purchases of 4C over 100 years. This will diversify reserve currencies ([fiat and gold](#)) with 4C and will help finance mitigation and sequestration (M&S). 4C rewards for M&S can bypass banks, [improve currency liquidity for global trade](#), and be used to balance or increase aggregate demand. The 4C supply will be pegged to the CO₂ mass mitigated, to *physically* couple it with the climate.

World Gross Domestic Product (GDP) by Region Expressed in Purchasing Power Parity, Reference Case, 1990-2030



VIEW



Time line

Presented is a time line for policy development. A fast track might involve parallel projects to develop 4C pilots in various situations.

TIME LINE FOR GLOBAL 4C MITIGATION:

(A) July 2014-Dec 2014: Find sponsors and partners for Global 4C, Launch Website (g4cm.org), Publish Journal Papers defining the 4C Economic Instrument

(B) Jan 2015-Dec 2015: Global 4C Study Commences, Set-up Collaborative Website (g4cm-policy.org), Undertake 4C Macro-Economic Modeling, Undertake 4C Policy Analysis, Undertake 4C Legal and Constitutional Review, Undertake 4C Ethics Review, Direct outreach for political and policy allies.

(C) Jan 2016-Dec 2016: Global 4C Study Continues, Develop Multi-Media Presentations, Publish a 4C Policy White Paper, Present Key Findings (Conferences), Direct outreach for political and policy allies.

(D) Jan 2017: Find Financial & Political Sponsors for Advocacy, Find Policy Custodians, Build Strategic Alliances, Strategy for a bill to Congress.

Sub-proposals

GLOBAL 4C MITIGATION SUB-PROPOSALS: We have submitted two sub-proposals as a priority: (1) to overcome political deadlock, and (2) to improve land management for protecting biodiversity and to bio-sequester GHGs as advised by the IPCC (2013, 2014).

(1) [Global 4C: Empowering Humanity for Carbon Transition with Smart Money](#)

Proposed is the five council architecture for Global 4C negotiations (see Table 1). The councils are to negotiate national and institutional contributions for raising the 4C price in foreign exchange markets over 100 years to mitigate climate change.

(9) [Settle the carbon debt and release the power of example!](#)

Developing countries may negotiate joining Global 4C to settle damages by developed countries caused by historical GHG emissions. Class 4 rewards could be offered to these countries without requiring sponsorship.

(2) [Global 4C: Managing Land for Carbon Sequestration with Smart Money](#)

Pitch: Global 4C advocates a new source of global finance that will reward carbon bio-sequestration and the protection of biodiversity. Category of the action: Land use

STRATEGY FOR A GLOBAL PRICE ON CARBON: We also link to (3) fee-and-dividend (F&D) as an important and complementary plan for raising the aggregate price on carbon. The other proposals shown below are promising and synergy with rewards to be paid by Global 4C.

(3) [The Little Engine That Could: Carbon Fee and Dividend](#)

Global 4C is not in competition with carbon taxes or the F&D advocated by the *Citizens Climate Lobby*. Global 4C does not collect revenues, as it will be funded through currency purchases and trade demand. The 4C price signal complements the F&D, and so the F&D was adopted as a sub-proposal. To appreciate the significance of combining 4C and F&D, we might consider the view of Prof. Kevin Anderson (Tyndall Centre for Climate Change Research) who claims that 1°C may be as 'dangerous' as 2°C and that there is little chance of making the radical emissions reductions to stay below 2°C. With high GDP growth in China and India, should we be looking for a "*big engine that can*"?

F&D and 4C are complementary opposites: F&D takes from polluters and gives to 'society', and 4C takes from the 'global economy' and gives to enterprises that mitigate and sequester. We have taken care in explaining that 4C rewards do not come in conflict with PPP if social equity is addressed in context of cost-benefit analysis and social preferences.

Some relevant questions are: (a) What is the comparative potential for F&D and Global 4C to be globalized? (b) What are the comparative vulnerabilities of F&D and Global 4C to: i) political opposition by carbon intensive sectors, ii) conservative politics over taxes, and iii) infighting over revenue and budgets. A challenge for Global 4C is that the new message is unorthodox: the "rewards for carbon" are outside the box. Crypto-currencies are also alien to many people. George Shultz (webinar July 11, 2014) suggested that a simple and clear message is best in politics: "carbon tax". Global 4C is not as simple as this, but prior to 1990 there was no carbon tax and the issue of climate change was poorly understood by the public. Hence we need to think ahead and embrace the future otherwise we could be planning with the wrong tools.

There could be significant environmental damages when warming exceeds 2°C, and this may adversely impact governments' ability to raise carbon taxes for more than a couple decades (with/without dividends) or it may erode international solidarity over the climate. The 4C exchange

rate would be an institution so enabling continued international cooperation.

The [REMI analysis of F&D](#) is promising for employment and GDP in the U.S. The next major step for Global 4C is to undertake an economic model for the world economy and a subsequent white paper. Political delays pose the largest uncertainty for forecasting climate change mitigation. It would be prudent, then, to assess the political feasibility of Global 4C as a priority.



EXAMPLE PROPOSALS THAT SYNERGY: Global 4C reward rules apply mass balance laws and Kaya formulae to calculate the mass of GHGs to be rewarded for mitigation and sequestration.

(10) [Reversing Climate Change with Ocean-healing Seaweed Forests](#). If this project can verify the net removal of CO₂-e from air to reverse ocean acidification and global warming then it would qualify for Class 4 rewards. If biodiversity is improved then a premium would also be rewarded.

(4) [Fighting Climate Change and Wildlife Extinction With One Of The Largest Carbon Capture Projects In The World](#). Reforestation, avoided deforestation and protected biodiversity qualify for Class 4 rewards of Global 4C. 4C micro-rewards would be given to registered locals via their mobile phones (under a pilot project). Geo-social networks will be created. Geo-statistical analysis of satellite images and field data are needed to verify sequestration amounts and assess biodiversity weighting for rewards. Rewards are for net mass with a conditional contract for 100 year safe storage whilst the project is current.

(11) [Synergies of Afforestation and Community Empowerment in Kenya](#). Reforestation would earn Class 4 rewards. At \$50 tCO₂-e on average, this project would earn about \$50,000 per year for 15 years, assuming that carbon is stored for 100 years.

(5) [Using Biogas Technology To Improve Sanitation And Mitigate Climate Change](#). This proposal uses sewage to make biogas and falls under Global 4C's Class 3 for 'cleaner energy in markets' (e.g. Fig 7). The rules require a mass balance of the net GHG emissions and an estimate of the emissions offset by displacing other energy sources in the market. Fluxes of different gases (CH₄, CO₂ etc) will to be taken into account.

(6) [Woody Agriculture: Breeding & Implementing Hazelnut & Chestnut as Staple Crops](#). Growing woody crops, agriculture can reduce carbon emissions per operational costs, and so earn rewards under Class 2 of the Global 4C system (Fig 3). Verification would require mapping with time.

(7) [Nicaragua: Carbon Sink, Economic Driver & Medicinal Plant Preservation](#). Similar to (4), reforestation projects on degraded land would be financially rewarded under Class 4 if there is net sequestration. For discrete projects, the rewards and applications can be based on numbers of trees planted (300,000) with the 4C rewards given pro rata over 100 years. Verification would

be needed every year or two, and this would encourage tree protection and monitoring.

(8) [Spontaneous Conversion of Power Plant CO2 to Dissolved Calcium Bicarbonate](#). If AWL can capture CO2 from exhaust gases and sequester these, then the process would receive rewards under Class 1 or 2 (industrial) and would likely be commercially implemented as an adjunct to existing industry. It does not qualify as Class 4 because it does not capture from the air.

How do these sub-proposals fit together?

The following sub-proposals fit together in terms of developing the Global 4C policy, undertaking advocacy and implementation. The pilot projects assume that funding is available to run these projects and that they can be used in parallel programs to develop and test the 4C currency and administration systems. This would provide a synergy, as the trial 4C money would be given a notional value as an incentive to communities.

POLICY FEASIBILITY: Information sharing and advice.

(3) [The Little Engine That Could: Carbon Fee and Dividend](#)

POLICY ADVOCACY: A notional architecture for agreements amongst developed and developing countries.

(1) [Global 4C: Empowering Humanity for Carbon Transition with Smart Money](#)

(9) [Settle the carbon debt and release the power of example!](#)

REVIEW CLASS 1 REWARDS FOR HEAVY POLLUTERS: A social equity study of 4C and compare with the '[Internalized Price on Carbon](#)'

PILOT PROJECT CLASS 2 REWARDS - REDUCING EMISSIONS INTENSITY: One example in industry and one in agriculture.

(8) [Spontaneous Conversion of Power Plant CO2 to Dissolved Calcium Bicarbonate](#).

(6) [Woody Agriculture: Breeding & Implementing Hazelnut & Chestnut as Staple Crops](#).

PILOT PROJECT CLASS 3 REWARDS - CLEANER ENERGY IN POWER MARKETS: Example in a developing country.

(5) [Using Biogas Technology To Improve Sanitation And Mitigate Climate Change](#).

PILOT PROJECT CLASS 4 REWARDS - SEQUESTRATION: Bio-sequestration and carbon capture and storage (CSS) play a major role in the feasibility of strong mitigation (Weyant et al., 2014; IPCC, 2014b). For this reason, and to protect remaining biodiversity, we focus our attention on averted deforestation and scaling-up bio-sequestration with geo-social networks for financial rewards.

(2) [Managing Land for Carbon Sequestration with Smart Money](#)

(4) [Fighting Climate Change and Wildlife Extinction With One Of The Largest Carbon Capture Projects In The World](#).

(7) [Nicaragua: Carbon Sink, Economic Driver & Medicinal Plant Preservation](#).

(11) Afforestation in Kenya

Explanation of model inputs

EMF27 MODEL INPUTS: Global 4C relies on markets to find least-cost solutions for mitigation and sequestration, and so we do not intentionally pre-select technologies. The objective is to avoid dangerous climate change by creating a price signal in international markets and in remote regions that usually fall outside international markets. For this reason we adopt the EMF27 model inputs for the 450 ppm CO₂-e policy and the baseline efficiency to be conservative.

These model inputs assume all no-carbon technologies are available, and this is reasonably consistent with Global 4C, because 4C provides finance for new technologies (i.e. innovation).

Some of the above data are used in a preliminary analysis of 4C currency prices for the period 2015-2100. This analysis assumes that the Global 4C protocol is implemented in 2015, and the 4C reward price is equal to the carbon price for the 450 ppm pathway (RCP2.6). The Kaya Identity was used in the analysis to infer the gross mitigation rate. From this the 4C supply and market value were estimated (see Figs 8 & 9).

The analysis sets a lower bound on 4C reward prices assuming that 4C replace taxes (i.e. assuming equivalence). By raising the 4C price the rewards tend to compensate more of the abatement costs. If the 4C rewards increased by factor 10, for example, then they would deleverage a significant portion of the total abatement cost. The degree to which deleveraging could be used depends on the urgency of mitigation and on the carbon tax price (co-existing with the 4C rewards). A combination of taxes and Global 4C rewards should be used to strongly mitigate greenhouse emissions and achieve the 400-450 ppm targets. This approach will be more politically feasible than just relying on taxes.

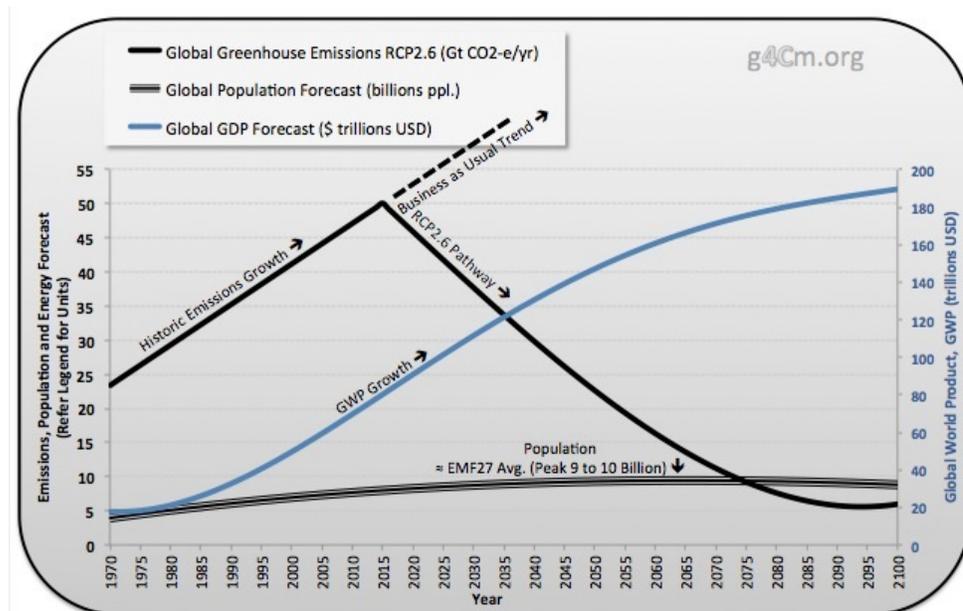


Figure 8. Polynomial curves were fitted to forecasts of GWP, world population, and the RCP2.6 pathway for emissions. A gross annual mitigation rate and the '4C' currency supply were then estimated assuming that global mitigation is 'disciplined' and responds perfectly to the IPCC's price on carbon (assuming rewards replace taxes). The discontinuity at year 2015 illustrates the degree to which RCP2.6 is physically decoupled from civilization's trend line. In practice, rewards would complement carbon taxes to limit pollution.

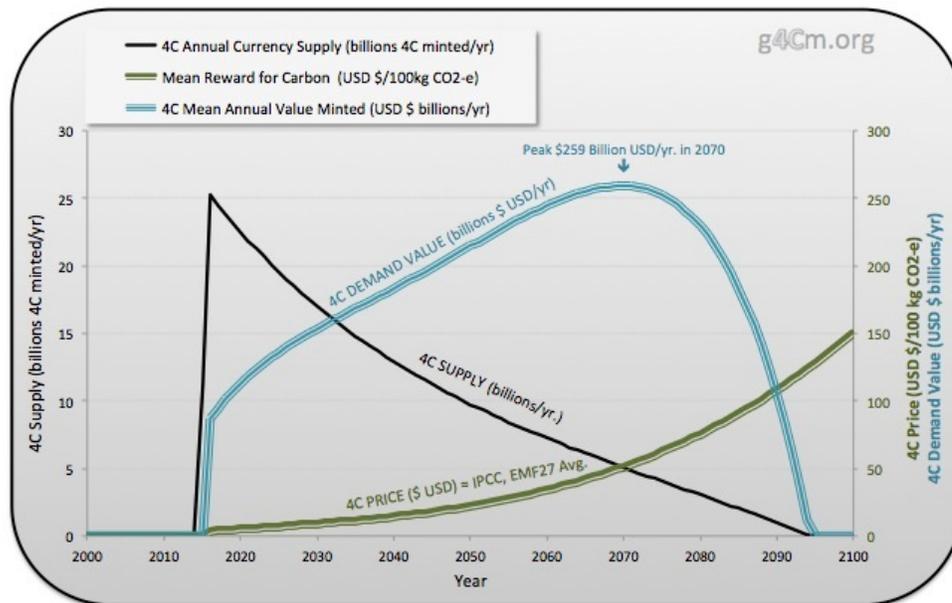


Figure 9. Results of the preliminary analysis for RCP2.6 include the '4C' minting (billions/yr.) and demand in FOREX markets (billions USD/yr.). The assumed '4C' price (reward for 100 kg CO₂-e mitigated) is the IPCC's (2013) projected price on carbon with the units changed. The analysis suggests that 78 GtCO₂-e (gross) total mitigation is needed by 2100. Given that international coordination is 'imperfect', and that civilization has a growth bias, it is plausible that '4C' prices and supply will have to exceed the above estimate. By raising the '4C' price by factor 10, the rewards would approach the estimated total abatement cost of mitigation.

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