Carbon Accounting for Cities and Communities

Report of the ICARB 6th International Conference on Carbon Accounting

City Chambers, Edinburgh, 5th September 2014

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Contents

Cover photo: Keith Baker

Conference Summary

Introduction

Cities and communities contain complex flows of people, energy, food, goods, transport and waste, which span many of the boundaries and scales used in conventional carbon accounting, and which can make it very challenging to collect and process data that is robust enough to allow for cross-comparison of results. This year the ICARB team worked with a range of international and local organisations such as ICLEI, ISCI, ISES, the Transition Towns movement, Community Energy Scotland, and local authorities across Scotland to develop a conference programme intended to provide a unique forum for the exchange of ideas, knowledge and innovation for city and community level carbon accounting.

Delegates to the conference heard from experts in carbon accounting ranging from those involved in international programmes to those from cities and smaller communities who are accounting for the costs and benefits of carbon reduction projects, such as installing local renewable generation systems, CHP networks, and micro-grids.

The opening plenaries dealt with the issue of how to compare the outputs of different city level accounting approaches and methods, and how to work towards establishing sufficient consistency to enable the outputs of the exercises to be considered robust and compatible with accounting methods used for accounting for economic sectors. Whilst the workshops focused discussions on a range of constituent methodologies encompassed by the key themes, and on the further development of solutions to key issues raised during previous conferences and workshops.

As always the International Conference marks both the beginning and end of ICARB's year, by drawing together the results of our activities for 2013-2014 and forming the basis for planning our activities for the year ahead.

Plenary Sessions

CDP: Progress and Challenges for Cities

Amanda Haworth Wiklund, Senior Advisor & Founder CDP Nordic

GPC 2.0 – the Global Protocol for Community-Scale GHG Emissions

Chang Deng-Beck, ICLEI World Secretariat

City-Level Carbon Accounting in Copenhagen – Why, What and How

Morten Højer, Special Advisor on Climate and Economy, Climate Unit, City of Copenhagen

The Challenges of Harmonising City Level GHG Accounting: Experiences from Glasgow

*Graham Pinfield, The Step Up project, Glasgow City Council***.**

Making Emissions Inventories Comparable and Useful

Sebastian Carney, Carbon Captured Ltd.

The theme for this year's conference highlighted the growing need for harmonising carbon accounting from local to global levels, which is being supported by the development of the new Global Protocol for Community-scale Greenhouse Gas Emissions (GPC 2.0). This new protocol pays particular attention to improving accounting for Scope 3 emissions, many of which may be more difficult to account for but can be influenced more directly by community and city-level initiatives. ICLEI will begin piloting the new Scope 3 guidance in January 2015 and ICARB is keen to support this process.

A similar theme that emerged from the conference presentations was around widening scopes more generally. Amanda Howarth-Wicklund's talk focused on how the CDP (formerly the Carbon Disclosure Project) has widened the scopes of both its work and the organisations it works with, whilst Graham Pinfield discussed how Glasgow City Council has widened the scope of its activities to better engage people with the need to reduce emissions.

Finally, Seb Carney pre-empted some of the workshop discussions by presenting his work on how emissions inventories can be constructed to be more useful and relevant to decision-making.

Workshops

The parallel workshop sessions were split into two key themes: Buildings, Businesses and Data; and City and Community-level Accounting. The former being intended to further develop discussions on popular topics from previous conferences, and the latter intended to allow more detailed discussion of the key issues for this years' conference.

The workshop sessions were opened by presentations from speakers with practical experience of carbon accounting in these fields, after which the groups split in two again to focus discussion on barriers, drivers and solutions for specific aspects of carbon accounting.

At the end of the session workshop chairs reported back to the final conference session, and the notes from each discussion can be found in the appendix to this report.

A common and timely issue raised in the workshops was the issue of trust, which bridged discussions on organisational working, public engagement, and data security. Of particular note were the challenges to the view that Scottish communities, community organisations and public bodies are generally working well together, and it became clear that more support is needed to facilitate this. Another issue in need of investigation is how the growing public awareness of data security arising from a growing number of leaks and revelations is affecting their attitudes to their energy data, and how it is collected and managed. There are considerable benefits to be had from making more and better energy data more widely available, but this needs to be done sensitively and transparently if we are to avoid a backlash that could impact more widely on public trust in the climate change agenda.

Also on the theme of data, many participants addressed barriers and solutions for making emissions inventories more relevant to decision-makers and other users. A recurring point was the disconnect around accounting for and managing Scope 3 emissions between communities, which can exert more influence over them and so are keen to quantify this, and cities, for which the task of accounting for them is much more complex because they are harder for them to manage and influence. However there are a growing number of groups and organisations engaged in joining up this accounting and the new GPC 2.0 is an important step towards standardising and codifying solutions to these problems.

Finally, fundamental to many of the issues discussed was the need for greater understanding, be this of accounting methods and tools, matching data availability with data needs, technology, ways of working together, or communicating our aims better by enabling people to understand how they fit into the bigger picture of climate change and sustainability. We hope you'll find the more detailed notes in the appendix helpful in understanding more of these discussions.

Conclusions and Ways Forward

The ICARB International Conference marks both the beginning and the end of the ICARB 'year' (we're currently running on an 18 month cycle), and this year's theme encompassed a set of issues that we have returned to because they exemplify some of the biggest 'wicked problems' in carbon accounting, and which require carbon accountants to work with increasingly wider audiences to arrive at common solutions. In recognition of this we have partnered with the Transition Towns network as a first step towards engaging more widely ourselves, and we hope to build on this in the coming year.

We are now planning our programme of activities for 2014-15, which as ever will carry forward the findings from this year's conference and workshops whilst responding to new needs for our support. The GPC 2.0 Scope 3 pilot presents an important and interesting opportunity for both research and better engagement and is likely to form one focus of our activities, whilst delegates to our Backcasting and Energy Storage workshops have helped us identify other issues to pursue over the months ahead.

These three apparently very different themes are more closely linked that it may seem at first – energy storage solutions are becoming more available to cities, communities and households, and backcasting can be an effective way of engaging people and organisations at all levels of society with the bigger picture. And as recent political events have shown, engaging and empowering communities, and giving them the tools to empower themselves, is essential in bringing about the sorts of more radical changes in attitudes and opinions that must underpin our efforts to reduce our carbon emissions.

Acknowledgements

The ICARB Team wishes to thank all our speakers, chairs, scribes and delegators, and all those who have supported our activities over the last year.

Special thanks go to our conference funders, The Castanza Trust, The City of Edinburgh and CIBSE.

Appendix: Workshop Reports

Workshop 1: Buildings, Businesses and Data

Opening presentations

Challenges of Collecting Usable Data from a University Micro-Grid, David Somervell, Sustainability Adviser, University of Edinburgh.

The Effectiveness of Domestic level Carbon Accounting Tools: Lessons from a Passive House Case Study, Asif Din, London Metropolitan University.

Lessons from Business Accounting Experiences in Scotland, Mike Bonaventura, CEO of the Crichton Carbon Centre.

Workshop 1A: Collecting Data from Micro-grids, Communities and Campuses

Chair: Adam Hawkes, Centre for Environmental Policy, Imperial College London

Facilitator: Sam Chapman, ICARB & Heriot-Watt University

Scribe: Muhammad Usman Mazhar, De Montfort University, Leicester

This report presents the notes of the workshop in the same sequence as discussed by the participants. The information is not linked with any of the participants and is kept anonymous to ensure data protection. The following issues were discussed in the workshop:

Methodologies

Initially, an observation was made that using methodologies that are developed for specific purposes and so trying to apply them elsewhere can be problematic. For example, under the Kyoto Protocol, there are common responsibilities and accounting can be constructed to push industries to reduce their Scope 1 and 2 emissions in line with these. However, whilst Scope 3 emissions are major sources of emissions for communities and cities reporting these has generally been optional. This raised the issue of how appropriate conventional (corporate-focused) accounting methods are for cities and communities. A question was also raised as to whether cities are overly complex for accounting and might be better accounted for by building up from sub-sets of emissions (e.g. campuses).

Drivers

- Expectations on public bodies to report on carbon emissions are growing.
- Managers/people responsible for stewardship, whether it's a household, a village or a nation, recognise that the true cost of energy waste is often reflected in emissions, which helps to raise awareness and works as a positive pressure for better reporting.

- Customers' expectations are a driver because the implications of the IPCC Fifth Assessment Report are becoming clearer and people increasingly want something to be done now. However measuring and managing emissions needs to be conducted with a clear (and communicable) purpose.

Joining up reporting

One of the participants said that we have a small community group in the area looking at the energy use and heat and it is in no way connected to any higher level reporting process. It is very self-contained and is meeting its own needs and requirements of the community. Their next challenge is to connect their methods at a higher level reporting system. The Scottish Government is enabling this but the outcomes are still a work in progress.

Geographical boundaries for city-level accounting

Another participant mentioned that in Glasgow they are looking at the city level and are breaking down into data zones, which encompasses residential buildings and transport etc. This is relatively easy where traditional geographic boundaries (wards, etc) delineate largely residential or industrial areas (etc), however this becomes more difficult if those boundaries have not been adjusted to reflect changes in use.

Challenges for organisational accounting

Organisations want to measure their environmental performance, and it would be sensible to compare the results of carbon reduction interventions alongside overall performance. However a greater understanding of how different organisations operate (e.g. how buildings and capital assets are used in practice) is needed to make more meaningful comparisons across similar organisations. One participant mentioned that when they look at their trends in their organisation they do not compare well with those of other organisations. More internal, as well as external, benchmarking is needed.

Implementation

A question was raised of whether and how information from universities and other bodies can feed into a city-level carbon accounting practices. For example, the development of heat maps is seen as a good idea but they are not yet sufficiently robust and comparable to inform investment decision-making. It is not helpful. The challenge is to implement accounting methods that can best bridge the gap between analysis and implementation of carbon-reduction actions. These need to be consistent, coherent, and verifiable.

Progress in NHS Scotland

NHS Scotland has much more consistency in the data, which they are making available to others and which could provide a lot of very useful information. This is all held in a consistent way and it is working quite well. This greater consistency means it is possible compare hospitals with each other, however this remains to be achieved in practice. More awareness-raising is needed to capitalise on this opportunity.

Drivers for better carbon accounting

There was relatively less focus on drivers during the discussions and the main focus was barriers. Financial costs were seen as the key driver for governments to reduce energy use, whilst whole life carbon cost is/was seen as a less important.

Barriers to better carbon accounting

The group identified a range of barriers to better carbon accounting, as follows:

- People collect data, but do not know how to use it
- Lack of understanding of measures / metrics (tCO_2 etc)
- Inconsistency and lack of clarity between accounting tools and techniques, and how to use them
- Lack of consistent methodologies and data management protocols
- Lack of stakeholder engagement
- Lack of robust information to inform decision-making
- Lack of understanding of how to go from measuring to managing data – lots of data is being collected but not all of it is being used effectively
- Improved understanding of data and there a disconnect between accounting tools/initiatives and informing abatement-related decisions
- Scope 3 includes major sources of emissions from communities and cities, however communities are better placed to account for and influence Scope 3 emissions, whereas accounting for and managing Scope 3 emissions is a complex task at city level.
- Boundaries for accounting for Scope 3 emissions are difficult to establish due to inherent complexities such as transboundary effects.

Solutions for better carbon accounting

Technological changes

- Traditionally, standards have been barriers (lack of standards, conflicting standards, etc), and as such it is important to periodically review accounting standards and procedures to ensure they are clear and consistent.

- Different organisations are using different accounting approaches and a degree of flexibility is needed for organisations to choose what best suits them.
- Increasing the availability of information for decision-making is key and should be welcomed by society, however this comes at a time when data security is a growing public concern.
- Reliable metering is needed for better data collection.
- More use could be made of internet-based platforms for sharing data on energy usage, however more investment is needed to make these more accessible and easy to use.

Cultural and behavioural changes

- It was argued that people need to see the 'whole vision' - what we want to do and what we want to achieve. Although public bodies are increasingly making sustainability reporting mandatory, much remains to be done to build confidence in what is being required, and to build confidence that this reporting will have the desired impact.
- Leaders / 'champions' are not sufficiently visible. We need more visibility, coherence and clarity. Bristol City Council, where the Mayor has taken leadership and is seeking European funding for carbon reduction programmes, was cited as a good example of this.
- Need more engagement and effective communication with all stakeholders.
- Information, advice, guidance and support are essential for building capacity.
- Health and wellbeing initiatives / programmes / schemes are an under-utilised way of engaging with the public. Food and health issues are important drivers for enabling the low carbon agenda.
- Engaging with children through the National Curriculum is an effective way of enabling the low carbon agenda, particularly as the issue cuts across many subject areas.
- Brainstorming and workshop sessions are useful ways of engaging stakeholders.
- Greater capacity building efforts need to be made by both local and national governments.

Structural and institutional changes

- We need to think beyond carbon – e.g. food-related projects are an effective way of engaging people with reducing their emissions, even if the carbon benefits of these are more difficult to quantify. Carbon footprints can be developed as by-products of other projects / initiatives.
- Using different schemes and initiatives in cities and communities according to knowledge of what will work best locally.
- More evidence is needed to inform political directions and investment decision-making in organisations, for example savings from previous projects need to be accounted for when building cases for investment in future projects.
- We need better tools for prioritising and making decisions.

Workshop1B: Building and Business Level Carbon Accounting

Chair: Stuart MacPherson, Irons Foulner Consulting Engineers and CIBSE Scotland

Facilitator: Asif Din, London Metropolitan University

Scribe: Ikenna Ajiero, Heriot Watt University

Energy management: data capturing, consistency and communication

- Data integrity: the use of simple or low cost metering tools ends up providing energy managers with basic or even wrong building performance information. Energy management requires some reasonable level of investment.
- The main question at the energy monitoring level is "what tools do we use in gathering our data: manual, semi-automatic or automatic?"
- Importance of the Building Management System (BMS) or Building Automation System (BAS) including its ability to manage, monitor and control building services at various levels were explored. It was established that its performance heavily relies on the data signals from outstations monitoring separate zones. However, in view of its capital intensiveness and technical complexities, the number buildings using the BMS for energy management remains relatively limited.
- Sub-meters are considered helpful for detailing specific zones with energy intensive operations. Separate sub-meters were considered useful for measuring gas, water and other building utilities.
- Distribution boards integrate many different meters, often up to 60; who actually reads the whole meters in the case of manual data collections?
- Energy mangers are, and should remain, engineers - not accountants.
- Most investments and refurbishments do not reflect improvements on carbon emissions.
- CO_2 equivalent/m^2 energy assessment method has been faulted given that it does not take into consideration how buildings are constructed, occupied or managed.
- Data availability and credibility constitute major needs for any efficient energy management strategy.

Energy performance assessment and simulation

- Industry seems to mostly use free tools for its building energy performance assessments. Downsides of these tools were highlighted. Tools such as the Athena eco calculator, BEESs, NTm, Eco Transit, IES-VE SBEM, WRAP waste tool and Zero Waste Scotland were assessed based on different parameters.
- Inconsistencies in results from different energy evaluation tools remain a major problem
- Inability of most tools to integrate both the embodied and operational carbon of building materials for performance assessments is a key challenge to the credibility of these tools.

Knowledge of a building material source will go a long way in determining its embodied carbon content

- Most of energy assessment tools are US based; thus, their metrics are not consistent with the British standards and most of these do not precisely capture the global position of locations in the UK.
- Interoperability of these software programs remains a great challenge to their integration.
- Robust data assessment is required for any robust energy decision.
- Albeit, it was considered that 'some numbers are better than no number' but confidence in the numbers and its corresponding assessment results remain crucial.
- Development of standardised notional buildings that can be referenced for building assessments should be considered by ICARB.
- Sensitivity analysis will help in enhancing the assessment methodologies of building performance assessment tools.

Building energy performance interventions

- Even good interventions such as investing more resources in retrofitting and improvements on the energy monitoring systems have their unforeseen consequences. Energy interventions must be heralded by a detailed energy audit to ensure the right resources are channelled to the right service(s).
- Building stock in the UK remains the greatest challenge to energy management. These structures are aged, their originally installed thermal insulation materials have now outlived their useful lifespans.
- Who should bear the responsibilities of thermal performance upgrade of these Victorian buildings? Government, energy providers, property owners or households? Accordingly, who bears the consequences of these poorly performing buildings?
- Microgrid renewable interventions at grassroots levels should be encouraged and incentivised.
- Awareness and sensitization campaigns should be supported by government, energy providers and trade bodies at all levels
- Feed-in tariff programs have been acclaimed an efficient way of accelerating the deployment of renewable energy; but other tax or ratepayers actually end up paying for these feed-in tariffs.

Overarching points: considered transition strategies

- Embodied carbon is of great importance in any energy assessment.
- Data fragmentation, inconsistencies and credibility constitute major concerns in carbon data management.
- Lack of confidence in data and tools lead to assumptions.

- Energy managers should focus on low cost tools, faster energy assessment methodologies, less data input and precise results.
- There is need for standard data validation platforms using appropriate validation routines.
- While observing the compliant bits, more voluntary energy commitments at the business and building levels should be encouraged: bottom – up engagements.
- Carbon sources keep growing, demanding higher application of carbon sinks at different levels, in order to achieve carbon neutral buildings.
- Need for sensitivity analysis.
- Thinking outside the box.
- Encouragement of more enlighten programs on energy use in buildings.
- Less competition, more integration, collaboration and synergies.

Workshop 2: City and Community-level Carbon Accounting

Opening presentations

Current Challenges in GPC Accounting For Cities, Morton Højer, Special Advisor on Climate and Economy, Climate Unit, City of Copenhagen.

Scottish Experiences in carbon accounting, George Tarvitt, Keep Scotland Beautiful.

Problems with current Scottish Practices in city level accounting, Philip Scott and Ross Jamieson, Heriot-Watt University.

Lessons from the Lochaber GHG inventory study for communities in Scotland, Susan Carstairs, University of Edinburgh.

Workshop 2A: City Level Carbon Accounting

Chair: Ryan Glancey of Aether Ltd.

Facilitator: Rachel Dunk, Manchester Metropolitan University

Scribe: Rita Kanu, Heriot Watt University

Barriers and drivers for better carbon accounting

Some participants felt that a major driver for carbon accounting could be the that 2°C increase in global warming will likely result in sea level rise of several meters as increased climate extremes are already apparent at 0.8°C warming.

The following barriers were also discussed:

Political, Legal, Regulatory, and Institutional

- Lack of incentives or greater cost of carbon, which makes carbon accounting seem not worthy of the effort and resources involved in it.
- Not accounting / risk of losing ability to take account for carbon savings imported across boundaries (e.g. renewable energy generated outside the geographical boundary of a city / community). Countries with major sources of income centred on fossil fuels find it difficult to let go of this source of revenue, and thus try not to attach great importance to issues associated to carbon accounting as it affects their business.
- It was noted that carbon accounting can obscure decisions or cause conflicts if people use it to pursue other individual / political agendas.
- The cost of carbon accounting can be quite expensive and there is a question of who should bear the cost of such an expense, set against who the results will be more beneficial to.
- Local authorities have access to more accurate data from energy providers on gas and electricity consumption, whilst data for coal and oil use tends to be estimated. This challenges the accuracy of the data available for carbon accounting
- There is a time lag from the year DECC data is collected and the year for which it is released, thus making it challenging to take proactive actions.
- Some cities with historically important areas / buildings encounter challenges when managing carbon emissions, and need assistance to ensure that carbon management and the management of of historic areas do not present conflicting needs.
- The economic recession has not helped, for example by encouraging the relaxation of emissions standards for buildings whilst the construction industry recovers.

Methodologies

- The ‘control approach’ (as used for corporate accounting) may be more useful for cities than using geographical boundaries.
- There is a lack of clarity on the assumptions used in some carbon accounting practices. This means that different data may be generated based on different assumptions for different localities, thus making it difficult to have a basis from to compare data for different cities. Thus inventories may need some (limited) flexibility on basic issues to enable better comparability.
- There is a lot of concern about the accuracy of data being generated. How good is good enough?
- Local authorities need carbon accounting to better enable them to manage their own activities.
- Too strong focus on emissions runs the risk of driving greater privatisation of services.

Technological

- Technology – certainly helps.
- Too many tools available in the market for carbon accounting.
- Once you recognise different purposes for accounting then there will be different methodologies. Distinguishing between levels of activity is important. The new GHG Protocol is a little too tortuous!
- Crowd sourcing data via open platforms may be overwhelming – could provide too much data and data that cannot be meaningfully managed / used.

Capacity

- Strong variation in how well different councils develop their capacities in accounting – scale of support, number / types of staff involved, etc.
- Question of what benefits can be gained from detailed local data collection using council resources versus commissioning external consultants.

Levels of analysis

- Question of the value of collecting different levels / granularities of data – especially if the low hanging fruit are obvious. Going too fine may be less than helpful in some instances, whereas in others it may be necessary to ensure proper planning.

Solutions for better carbon accounting

The solutions discussed focused on the following themes:

Technological changes

- Understanding the technology to be used is key to ensuring it will be used effectively.
- Simplifying reporting makes it easier for the general public to have an idea of the importance of carbon accounting, and to engage with it.
- Smart meters may be undermining carbon reduction efforts if they show measures / behaviours are less effective than households expect. Also concerns about data security.
- Technology is now enabling more direct measurements of energy use, and this will need to be incorporated in future carbon accounting practices.

Cultural and behavioural changes

- Scottish cities are not talking to each other – many people would presume otherwise but it's not happening in practice yet. Much more information exchange is needed.
- Need to develop greater understanding of, and trust in, technology.
- Issue of leadership. Who sets the standards? And who is using them?

- Assessment of issues relating to carbon impact and how it affects decision making. If adequate consideration is given to figures from carbon data in making vital decision this will encourage other stakeholders in carbon accounting to put in more effort.

Structural and institutional changes

- Institutions determine the value of the information. Once that value increases it will drive improvements in the market and quality of accounting. Therefore there is also a benefit to increasing the market price of carbon.
- Need more and better local data – e.g. to drive improvements in local building stock (etc).
- Need to developing stronger economic arguments against fossil fuel generation.
- Need better synergy between local and national reporting so as to build a comprehensive dataset that can be more useful for decision making.

Workshop 2B: Community Level Carbon Accounting

Chair: Keith Baker, ICARB & Glasgow Caledonian University, & Eric Dodd, Community Energy Scotland
Facilitator: Jim Hart, Napier University
Scribe: Janaka Gammage of Glasgow Caledonian University

Prior to beginning the structured discussion there was some debate about what exactly constitutes a 'community', which could be interpreted as anything from a group of homes to an entire region, or even a highly geographically dispersed online community. Members of the group also commented that whilst Scotland has many communities (as they would recognise them) they lack a shared voice, an issue that re-emerged in some of the discussions that followed.

Data

Participants raised several issues with regard to the amount and types of data available for community carbon accounting. Some participants reported that data that would be useful for informing their accounting is simply not available to them. Reasons for this included the data simply not having been collected, the capacities of different groups to collect relevant data, the reluctance of individuals / communities to share information considered as personal / private, and data protection restrictions preventing community groups accessing data available that is available to others (local authorities, universities, etc).

An example of the latter, which was contested, was the availability of postcode-level energy consumption data (such as that collected by DECC). Participants were not clear as to the level of granularity of this data that is accessible to all (i.e. free and publicly available) however it was clear

that the process / access routes for obtaining it can be seen as labyrinthine to non-specialists. The group also noted that whilst central government has recently taken steps to increase such data availability, much more needs to be done to facilitate community groups' access to this.

Participants also raised the problem of some data being obsolete or not fit for purpose, for example due to not being sufficiently up to date or due to pre-processing / weighting / etc prior to publication – with up to date raw data being seen as most valuable and useful. The group felt that local authorities should lead on increasing data availability where central government is unable or unwilling to do so. Accounting for emissions from food production and consumption was raised as an important and long standing data gap, due to the number of community food-related projects.

As regards to data sharing, the group generally agreed that younger people tend to be much less reluctant to share 'personal' information due to the amounts they share through social media, whereas older people are more likely to consider data on their energy consumption and related habits as 'personal'. This appears to be an important example of the wider observed generational shift in attitudes and behaviours towards data sharing.

Trust

The issue of trust was the most important theme to emerge from the workshop, and relates directly to the issue of data privacy (see above). It was clear that significant degrees of distrust exist between individuals and organisations involved in community carbon accounting and influencing community carbon reduction.

One key example of where trust has broken down between individuals and government has been companies (legitimate or otherwise) cold calling and door stepping households to offer measures funded by the Green Deal and Energy Companies Obligation. However it was also apparent that distrust exists between organisations involved in delivering these and other schemes.

Here again, participants felt that local authorities, housing associations and community groups who have established a high degree of trust with their communities (e.g. Transition groups) have important roles to play in building and maintaining trust.

Boundaries and levels of control

The group felt that there has been some decoupling between accounting for territorial emissions and emissions that communities have the greatest influence over. The group felt that the forthcoming pilot of the GPC 2.0 accounting process for Scope 3 emissions should be very informative as it will focus attention on emissions that are harder to account for, but which communities can exert the greatest levels of control over, for example through transport behaviour change projects. At the moment this can a problem for communities needing to meet reporting requirements (e.g. for the Climate Challenge Fund) if they are more aligned to higher level inventories than to the emissions savings communities can have the greatest influence over.

Awareness and communication

Participants felt that awareness of energy and energy saving opportunities is still low amongst the public, and much more needs to be done to educate them, particularly the young. The EU ban on vacuum cleaners over 1600W, and the media's reaction to it, was given as an example of particularly bad communication, as was the media's frequent misrepresentation of statistics.

This discussion also led into the need to change societal norms with regard to a wide range of behaviours, with one example being that it used to be the norm for gentlemen to wear vests in winter.

Support and knowledge sharing

The group felt that enabling community groups to do more is an essential part, and that community groups are willing and able to engage with carbon accounting but more capacity building is needed to facilitate this.

Although a lack of funding was seen as a barrier there was strong agreement that much more needs to be done to enable knowledge and skills sharing between community groups. One organisation in particular was cited as being obstructive to knowledge sharing between communities.

Although there was no lack of enthusiasm, carbon accounting was still seen as less about 'doing' than other roles in community projects, with the analogy that it's always hardest to get a volunteer to take on the role of treasurer.

Tools

The increasing range and complexity of carbon accounting tools is a barrier to their use for community accounting, especially for groups lacking volunteers with technical / IT expertise. However, as the experience of Climate Challenge Fund projects has demonstrated, this is not necessarily an insurmountable problem, and could be at least partially remedied if (as discussed previously) reporting practices were more closely aligned with emissions that communities have the greatest capacity to influence. Here again the GPC 2.0 Scope 3 pilot may be invaluable in understanding how carbon accounting processes / protocols can be better vertically aligned to meet the needs of those at all stages in the data gathering and reporting chain.

Incentivising community involvement

The group raised the question of what are the incentives for involving communities in carbon reduction. Funding alone was not seen as a sufficient incentive, and whilst education and 'pester power' is useful, there actually needs a more holistic approach that uses the agenda to strengthen bonds within and between existing communities.

Technological solutions

As might be expected from a more action-orientated group of participants there was relatively little discussion of technological solutions. Although household energy monitors were seen as useful the group recognised their limitations (particularly the 'smart' meters currently being rolled out under the 2020 target), and measuring the energy consumption of individual appliances was seen as a 'one off' or niche activity.

However there was much greater support for increasing the use of social media, both for sharing knowledge within and between communities, and for engaging and educating young people about saving energy.

Education

There was a clear consensus that educating the next generation and encouraging them to adopt lower energy using behaviours is vital for reducing emissions, with several good examples cited, and that educating children can be an effective way of changing the habits of their parents (as happened with recycling). However using traditional teaching (i.e. lessons in schools) is only one aspect of how this can be achieved and educators need to think more widely about the potential tools at their disposal (e.g. practical activities, social media, etc).

Changing norms, attitudes and behaviours

This was a common theme throughout the discussions, as was to be expected given that many community-level projects focus on achieving behaviour change because this is an aspect of reducing energy demand that they can exert significant influence over. However the group felt that these efforts still need to be supported through measures such as advertising and local authority-led initiatives. Here again, the need to use trusted messengers was seen as critical to success.

In addition, there is an apparent need to change attitudes to sharing data on individual energy consumption and energy-using behaviours. Whilst there have been useful legislative changes to permit and encourage greater (relevant) data sharing, and a generational shift towards greater voluntary sharing of 'personal' data, more needs to be done to educate and reassure people (particularly older people) about the reasons for sharing energy data and the benefits it can bring to their communities.

Incentivising community carbon accounting

As mentioned previously, the group felt that more 'academic' tasks such as carbon accounting are less attractive to volunteers, who are usually (but not always) much more keen to take on more practical roles / activities. As such there is a need to make those who take on carbon accounting feel more valued in their roles – one way of achieving this might be to increase awareness of what carbon accounting actually is and the value of investing time in it.

Data protection and availability

There is still a great deal of reluctance amongst some members of communities to make what they consider to be personal information more widely available. However the other side of this coin is the need to enable communities to have greater access to this data where it is collected by third parties (e.g. local and central government), and whilst many data managers are making increasing efforts to do so it seems these have yet to really filter down to communities and the processes for finding and accessing relevant data need to be better advertised and simplified to enable wider access.

Personal carbon accounts

Some members of the group raised the idea of individual carbon accounts / budgets as a lever for carbon reductions. Although there was insufficient time for much discussion of the practicalities of this there is knowledge and insight to be gained from the experiences of groups (e.g. Carbon Reduction Action Groups) that have piloted such an approach.

Role of the energy companies

The 'big six' energy companies were not generally seen as enabling community energy demand reduction or carbon accounting. A radical shake up of the industry was agreed to be needed, possibly through new companies entering the market if government is unable or unwilling to intervene.

Knowledge sharing

The was a clear consensus that much more needs to be done to enable knowledge sharing within and between communities, and that existing initiatives to enable this are not having a sufficient impact. Participants were keen to make greater use of online facilities and social media (which also eliminate the carbon costs of meeting in person), as well as more traditional methods such as workshops and events. Here again, the GPC 2.0 Scope 3 pilot may be a useful opportunity to learn how to enable knowledge sharing in ways that better meet the needs of communities.

Trust and leadership

the strongest theme that emerged from the discussions, building trust and using trusted 'messengers' appeared critical to the success of any community based / led initiatives, both for carbon reduction and carbon management. Whilst it was clear that relationships between community groups and some enabling organisations have not always been ideal, there were much more positive feelings towards local authorities, who were seen as being trusted, appropriate leaders, and generally essential to enabling action. Additionally the organisations cited as being most trustworthy are those delivering practical services on the ground, such as housing associations, advice centre networks, and of course community groups themselves.

APPENDIX 1: Morten Højer: Suggestions from Copenhagen on City Level accounting

1) Beware of the balance between climate mitigation and adaptation ("windmills or dikes?")

- Ideally you would want to keep an eye on both: observations seem to indicate that we are currently on track for a 3-5 degree C warming (the upper curve of the recent IPCC 2014 scenarios), this is outside any previous experience over the past millennia

- Furthermore, whatever is expected of the long-term future, using the four IPCC scenarios indicate a very wide range of potential outcomes that planners ought to start taking into account. Therefore, when you say "carbon accounting" you might in fact want to imply "accounting for climate change" on both mitigation (CO2e emissions reductions) and adaptation (responding to expected changes)

- In order to be able to do so, there is a significant role for the science community to scale down existing models to local/regional scale, and to develop appropriate responses with the wider community

2) Use different kinds of arguments to engage and promote change

- Mitigation can be described as a "global public good" – the questions and challenges are mostly related to international coordination (in the absence of a global government)

- This means that there might be limited political reasons why a city should be actively engaged, unless the potential local benefits and the potential drivers for a transition to a low-carbon economy take center stage – this is important to bear in mind at a local level

- From an entirely self-interested perspective, some might even argue that – since we are currently on the high-emissions curve – the city should spend relatively more resources on adaptation

- To approach this potential dilemma, I have argued that cities such as Edinburgh could use a combination of different arguments, ranging from overall political vision and leadership ("where do we want to go as a city? What are the risks of inaction?"), to a more science-based perspective ("what is needed?"), a social responsibility perspective ("What should we be doing?") to a more pragmatic approach ("what benefits are included?") and a strategic one ("how could Edinburgh position itself as a city on this agenda?")

- These different approaches might appeal in a differentiated way to different kinds of stakeholders. An intelligent approach would aim to take this into account in the processes of (i) identifying and engaging relevant stakeholders, (ii) building commitment, (iii) implementing change, (iv) monitoring and keeping track of progress, (v) adjust and follow up.

3) Consider synergies between mitigation and adaptation

- During the conference we identified a number of areas, where increased cross-collaboration could potentially benefit initiatives on mitigation and adaptation, e.g.(i) retrofit of buildings, accounts of gaps, codes and standards (ii) comparison of actual vs. estimated numbers, such as energy consumption, overheating/cooling

- The experience from Copenhagen so far indicates that climate adaptation, when it reaches the stages of actual implementation, requires a very distinct geographical focus, which makes it suitable for creating tighter links with other kinds of city planning, including city-development projects (brown-field, green-field etc.), building retrofits, infrastructure planning

- Mitigation activities could benefit from such a perspective. However, this requires integration across many layers of government and analysis/planning

4) Use global trends to drive local change

- Slide 2 in my presentation in shows a potential move towards a growing number of dispersed, regional GHG emissions trading systems. Experience from Chile and elsewhere have shown that such systems in their own right can help improve accuracy of GHG emissions inventories, as the information becomes more valuable

- Question: should Scotland consider a regional system (perhaps focused on SMEs if possible)?

- Furthermore, if connectivity between systems is improved, either through the UNFCCC or otherwise, then there is a potential "game changer" that Scotland should consider

5) Consider GPC aligning with the UNFCCC process

- The city-level GPC standard is a potential game changer, if it moves further into a formalized UNFCCC city-level inventory – not entirely unthinkable in the run-up to Paris 2015

- Under those circumstances, cities would be able to show their GHG emissions and document their initiatives, thereby creating a potential competitive edge vis-à-vis national governments

- Cities are increasingly seen as potential drivers, not only of GHG emissions reductions, but also of competitiveness: http://www3.weforum.org/docs/GAC/2014/WEF_GAC_CompetitivenessOfCities_Report_2014.pdf

- There seems to be a potential gap, where cities could use ongoing international processes to make a step-change in their climate strategy and GHG emissions inventories

6) GPC challenge: geographical vs. organizational boundary

- As a final word of caution: the current methodological framework developed in the GPC standard is based on previous work with different kinds of standards, including the IPCC-based geographical boundary and the boundaries defined by other initiatives

- The GHG Protocol, originally developed for corporate GHG accounting and subsequently expanded towards project-level and value chain-based (LCA) accounting, includes a distinction between "scope" and "organizational boundary"

- The scopes are familiar in the IPCC guidelines. However, the organizational boundary is not.

- So when it comes to accounting for GHG emissions related to organizational entities, such as a local government, the boundary issues becomes relevant. Yet, the GPC does not contain any reference to this, nor does it provide a clear case for how potential dilemmas should be resolved

- Within the "organizational boundary", the GHG Protocol contains a distinction between principles of equity (e.g. ownership share) and control (e.g. degree of influence). The latter allows local governments to account for initiatives outside the geographical boundary

- It remains to be seen, how the GCS standard would affect current GHG emissions inventories across cities that have based their work until now on other standards/guidelines