



MSc paper: Effective Underground Coal Gasification (UCG) Stakeholder Engagement in Scotland: Possibly Narrow, but Cannot be Shallow?; Daniel Gilbert, April 2014

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• **Abstract**

This paper analyses the Scottish UCG sector from the standpoint of its private sector licensees and contrasts, given the presumption of limited available resources, the efficacy and risks of broadly deployed stakeholder engagement resources, including with respect to civil society, as compared to the alternative of a more focussed, narrow front, stakeholder engagement targeting public sector policy makers and regulators as the two key priority groups. This paper takes a practical, descriptive and pragmatic approach to these issues, applying stakeholder theories centred that are centred on constructs of saliency, urgency and power are central to the analysis conducted; “Who or What Really Counts” (Freeman, 1994). It concludes that both strategies are risky and that more research needs to be done in order to provide the industry with definitive guidance on its best course of action.

Word Count: 3,534

• **Table of Abbreviations**

BERR	Business, Enterprise and Regulatory Reform (UK government department until 2009)
C2H6	Ethane
CA	Coal Authority
CCS	Carbon Capture and Storage
CH4	Methane

CO	Carbon Monoxide
CO2	Carbon Dioxide
CSR	Corporate Social Responsibility
EU	European Union
FAUG	Falkirk Against Unconventional Gas
FoF	Firth of Forth
FoTE	Friends of the Earth
FSU	Former Soviet Union
GHG	Greenhouse Gas
ME	Middle East
NGO	Non-Governmental Organisation
OH	Hydroxyl
SEPA	Scottish Environment Protection Agency
UCG	Underground Coal Gasification
UCGA	Underground Coal Gasification Association
UCGP	Underground Coal Gasification Partnership

Introduction

UCG is a novel and nascent industry in Scotland, production has yet to start and cannot do so whilst the six license moderately-sized license areas shown below are conditional on planning and other consents. The applicable regulatory regimes are currently still being developed in their entirety, representing both: a significant opportunity for UCG license holders to help shape, through stakeholder engagement, the regulatory environment to their benefit; and a threat, since until an established regulatory regime is in place this conditionality will remain and they cannot undertake any production. These companies continue to accrue costs in the meantime, and hence the financial pressure to get stakeholder engagement right, and as quickly as possible, is acute. Where to focus their necessarily limited stakeholder engagement budgets, and how to most effectively invest this money, is therefore a critical business decision for UCG firms in Scotland.

UCG Licenses:

- **FoF (Scotland)**



Key

	Area 1 – NT39
	Central Forth
	Kincardine
	Largo Bay
	Musselburgh

(b) Solway Firth (England/ Scotland)



 Solway Firth

Source: Coal Authority (2011)

Stakeholder theory was developed with this sort of issue in mind: “the impetus behind stakeholder management was to try and build a framework that was responsive to the concerns of managers who were being buffeted by unprecedented levels of environmental turbulence and change” and who were devoid of any useful answers deriving from “traditional strategy frameworks” demonstrably incapable of “helping them understand how to create new opportunities in the midst of so much change” (Freeman, 1984, p.7).

Contrary to accusations that stakeholder theory lacks clarity of thought, e.g. Ansoff (1965)’s claim that it conflates “responsibilities” and “objectives”, or can deflect private sector management attention from its fundamental core purpose of profit maximisation, UCG companies can usefully apply the stakeholder engagement “Principle of Who or What Really Counts” (Freeman, 1994) in their current situation as a means to focus their limited resources therein for maximum efficacy. Freeman’s work was developed shortly thereafter by Mitchell et al. (1997) in their paper “Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts”, an evolution of theory that posited three variables as the determining stakeholder salience, viz.: urgency; legitimacy; and power. Whereas the concept of legitimacy is normative, questions of urgency and power are fundamentally descriptive. Andriof & Waddock (2002, p.31) report on empirical tests regarding both aspects undertaken by Berman *et al.* (1999); perhaps unsurprisingly, “the results provide support for a strategic stakeholder management model, but no support for an intrinsic stakeholder commitment model”; that is, companies do the stakeholder engagement that is good for them, not the engagement that is good for society as a whole.

UCG firms are likely to conform to this pattern and focus their impact only on high urgency stakeholders, i.e. those who are: (i) aware of UCG, constituting a minority of Scots (McLaren Environmental, 2013a, p.15); (ii) for whom UCG is a salient issue, obviously (ii) being a subset of (i); and, (iii), who are also influential / powerful.

This paper seeks to answer the following question: is a strategy of narrowly focussed stakeholder engagement by the Scottish UCG sector likely to be efficacious given that the targeting of a comparatively limited range of stakeholders, identified through analysis of their “power” and UCG “urgency”, is undertaken to a substantial level, in sum if it is “narrow” but absolutely not “shallow”? Doing so, evidently, requires a very clear understanding of “who or what really counts” (Freeman, 1994).

Shareholders are immediately identifiable as scoring highly against both these criteria: UCG is of high urgency as they depend on it to make a profit; and they are powerful since the UCG firms require their funds to continue to operate. UCG, as a climate change inducing technology, is unlikely to attract “ethical” investment funds, and hence “engagement” of this stakeholder group is overwhelmingly driven by what the companies are presumably determined to do

anyway, i.e. run as successful businesses. For UCG, stakeholder theory adds little or no added value to traditional management theory, including agency theory concerns, with respect to this group.

Perhaps the most obvious stakeholder engagement group to target is that of the public sector, both public policy makers and regulators, this despite a low “urgency” ranking for very many of them, including those who are simply unaware of UCG at all. Regardless of variable urgency, regulators have the negative power of effective veto with regards to UCG, applying policy generated by policy makers in a range of public agencies and also legislatures (Scottish, British and European). Furthermore, many powerful individuals in this public sector group are keenly aware of UCG and are active in devising and/or implementing policy grounded in that knowledge and their resultant estimation of UCG as an “urgent” issue to them. The loci of this group includes the CA which issues UCG licenses, the environmental regulators SEPA (onshore) and Marine Scotland (offshore), the EU (e.g. with respect to the Water Framework, Industrial Emissions, Birds and Habitats Directives), the Health & Safety Executive, English regulators (e.g. the Environment Agency) in the case of the Solway Firth, and politicians such as Scottish First Minister Alex Salmond MP who is on record as stating It’s “likely that there are substantial hydrocarbon deposits, particularly in the central belt of Scotland. I think that the earliest opportunity that (will) be publicly acceptable may well take place in the estuaries. Particularly coal gasification, I think, has substantially good prospects. Particularly the Forth estuary, I think that would be of great interest. The possibilities of coal gasification are of substantial interest to us” (Holyrood, 2014).

The final main stakeholder group for analysis is both the problematic, that is: most probably negative, in a UCG context and also the group regarding which the answer to this research question rests: civil society/ communities, including its largely self-appointed NGO representatives, e.g. FAUG which is explicitly against all unconventional gas extraction (FAUG, undated), e.g. syngas via UCG. Of all the groups analysed, the chasm between stakeholder theory and traditional management theory is starkest when it comes to treatment of civil society, since the latter approach would be to essentially treat civil society as an extraneous factor, and hence outwith analysis and strategy making. This is not the case in respect to stakeholder theory, to which consideration, at least, of civil society is almost axiomatic.

Whereas the main analysis of this report indicates possible drivers for communities to positively welcome UCG, regrettably the “urgency” of these drivers are limited: UCG would create some Scottish jobs, but not many thousands; any downward pressure on domestic energy prices is uncertain in extent; an energy security crisis still feels remote in Scotland, located far from the FSU and not dependent on Gazprom energy; and commercial access to otherwise stranded coal resources will primarily benefit the shareholders of the UCG companies themselves, a very small minority of Scottish citizens. Fears, some justified and some clearly not justified, over transport and visual intrusion into their local environment (with possible negative economic implications, e.g. on house prices), uncontrolled underground fires, potable water pollution and the climate change implications of burning more coal are all likely to be of higher urgency amongst civil society, and are evidently so amongst environmentalist NGOs such as FoTE. Many other members of civil society are unaware of UCG, at least currently, and their level of urgency is therefore zero; amongst the cognisant, however, urgency levels will vary but almost invariably be negative.

In contrast, the overall level of power of this group is far lower than, say, with respect to onshore shale gas extraction, a situation that was explicitly the aim of the UCGP in 2006 when it proposed offshore rather than onshore licensing (BERR, 2006, p.4). Albeit that Scottish UCG

will be near offshore and not deep sea, the fact of it not taking place directly abutting or underneath people's properties or above potable aquifers has the result of limiting the impact of likely civil society objections in the same way that, but to a lesser extent than, exploration and then production of a new offshore oilfield can realistically be opposed by NGOs or communities. Civil society stakeholder engagement with respect to UCG therefore lies somewhere between that for North Sea Oil (i.e. very low impact) and that of onshore shale gas (i.e. very high impact), the exact location on this sliding scale being the critical point of analysis of this paper. Whereas the public sector stakeholders will require in-depth engagement to ensure positive outcomes, as perceived by the UCG sector, and "engagement" of shareholders is effectively business-as-usual, the minimum breadth of UCG efficacious stakeholder engagement, measured in strictly commercial terms, will be determined by whether civil society "really counts" for stakeholder engagement purposes as well, or not.

- **Development of the Outline of the Study**

The below section investigates the likely impact of different groupings of issues on whether community stakeholder engagement is a necessary priority focus area for the UCG sector, assuming the latter's over-riding stakeholder engagement approach is one of pragmatism not normative ethics.

- **UCG and Carbon**

Carbon is an important element of the UCG process, one where coal is gasified *in situ* in the coal seam whilst still underground, and the resultant "syngas" gaseous mix is then drawn off via production well(s), the main target gasses within this mix are CH₄, C₂H₆ and CO, but which UCG ignition also generates CO₂. All four gases are organic (carbon) compounds and are GHGs, CO₂ and CH₄ directly and CO mainly indirectly by reacting with and reducing the abundance of OH radicals that inhibit the lifetime of other GHGs, including CH₄ and CO₂. Whereas there are developed markets for CH₄, C₂H₆ and CO, providing UCG's *raison d'être*, this is not sufficiently the case for CO₂, and the realistic stakeholder worry is that UCG-produced CO₂ will be emitted atmospherically to a significant degree. The strict supply of air or oxygen to feed the UCG exothermic reaction is vital to maximise offtake of CO and minimise that of CO₂, however the generation of the latter is inevitable to a degree.

The most prominent declared future customer for unconventional hydrocarbons such as UCG produced syngas, is Petrolneos (BBC, 2014), the operator of the FoF local Grangemouth refinery and petrochemical plant located on the FoF. If chemical feedstock predominates as the dominant end use for Scottish UCG, as seems likely, then the applicable form of CCS is industry and not power station CCS, unfortunately the balance of public funding is strongly to the latter not the former. "Closed loop" UCG-CCS scenarios whereby CO₂ is sequestered in the gasification cavity are currently hypothetical only, given gaps in relevant geological knowledge and proven efficacy of this technique (Younger and Gonzalez, 2010). Climate change implications of UCG are likely to be significant both for civil society and public sector policy makers, particularly given Scotland's commitment (Scottish Government, 2009, p.1) to achieving an 80% reduction in GHG emissions by 2050, and hence this problematic aspect of UCG offers the potential for policy makers and civil society opposition to coalesce behind the single issue of climate change abatement, a dangerous scenario for UCG proponents and one implying that civil society may also need to be significantly targeted through the sector's stakeholder engagement activities.

- **Local Environmental Concerns**

Aside from GHG and climate change issues, of global range, local environmental (broadly defined) issues are also likely to be of high salience with regards to UCG. These include: additional road traffic (resulting in more travel congestion and air pollution); perceived negative aesthetics, not least in areas of natural beauty where both the tourism industry and residential property prices, may be negatively impacted therein; mine water contamination of potable water including via existing deep coal shafts or uncontrolled fires due to unplanned airflow from the same; worries that hydraulic fracturing (fracking) could take place as part of the UCG process, resulting in (say) fracking fluid-induced pollution. The fact that the FoF has a maximum width of just 19 miles (Gazetteer for Scotland, 2014) increases the saliency of these concerns, as does the FoF's coastline: its central UCG licence area is viewable from many shoreline directions, including from the capital city of Edinburgh, which also directly abuts the Musselburgh licence area (see maps above). The question is whether community opposition driven by the above, local environmental, concerns is likely to be mirrored in the concerns of policy makers and regulators, thus creating a powerful anti-UCG coalition.

The FoF is a working waterway, a factor that works both ways: Forth Ports has a commercial imperative and statutory responsibility to keep the waterway open for maritime trade, and therefore has an *a priori* precautionary principle-driven reason to oppose UCG, but the fact that there are already an abundance of industrial and trade activities taking place there may suggest to other policy makers that additional UCG ones should also be allowed. Of course, this is unlikely to persuade homeowners who consider that their property values have been negatively impacted thereby and, even so, Forth Ports' extensive powers to legislate local bylaws, for instance see Forth Ports (2007), conferred onto it by Part VI of the Forth Ports Authority Order 1969, ensures that it is a stakeholder that "really counts" (Freeman, 1994) and whose support, or at least acquiescence, would need to win.

The increase in traffic is unlikely to be very significant over a sustained period of time, and UCG's Scottish location offshore results in aquifers reached by drilling being saline, and hence "permanently unusable" rather than potable, potentially drinking, water. At the deep levels that UCG would be required to take place, these aquifers are all but static, and by drilling deep UCG operators can further enhance their health and safety credibility amongst stakeholders by locating gasification cavities far below the deepest of UK coal shafts and, given the extensive and still extant maps of those shafts, at great lateral distances too. Because deep UCG cavity locations also result in the high pressures required for CO₂ to become "super critical" and hence change to a liquid state, compacted *in situ* liquid state CO₂ sequestration may be possible in the gasification cavities, creating a closed loop carbon system (Younger and Gonzalez, 2010), but only once/if the required technological advances are made and local geological knowledge collected. Even without this positive outcome, fears over contamination of potable drinking water should be straightforward to allay by the UCG industry through dissemination of sound, relevant scientific research. Likewise, any unplanned underground fire should be extinguishable through flooding with nitrogen. Whereas these answers (underground fires, traffic and water contamination) and hopes (carbon sequestration) will not satisfy many opponents in civil society, overall the force of these arguments should restrict opposition to manageable levels.

In summary the positive attitude shown by First Minister Salmond can be expected to result in more appreciative treatment by Scottish civil servants and public agencies, mitigating the geographical impact of the capital city (and both residential and office location to a large proportion of Scottish policy makers and regulators) being directly bordering all but one of FoF's UCG licence areas. Overall, local environmental concerns are likely to be the anti-UCG driver

(McLaren Environmental, 2013b, p.2) far more of civil society than Scottish policy makers, implying that civil society's likely opposition may be a largely isolated one.

- **Untried, Untested**

A further stakeholder, articulated by local elected politicians including Claire Baker MSP (Courier, 2013), concern is that offshore UCG is untested, and since all Scottish UCG licenses are currently offshore only, this increases perceived risk and stakeholder resistance to becoming "guinea pigs" for the new technology, in contrast to the owners of the companies who are unlikely to live locally. Again, a risk averse fear of the unknown and preference for the application of the precautionary principle is likely to be shared with at least some policy makers, in particular those focussed on environmental protection, leading to the same coalition of opposition posited above (section 4.1), and the same potential results and implications.

- **Benefits Sharing**

More positively, UCG allows access to coal reserves that are inaccessible either via open cast or traditional underground mining techniques. Otherwise coal stranded reserves which can thus be reached include those offshore, beyond the reasonable limit of lateral from onshore underground mines. Issues of energy security and price are of high salience in the context of both declining domestic North Sea petroleum production and political uncertainty in major energy producing regions such as the FSU and ME. Furthermore, the development of the UCG industry could bring economic benefits to host localities, e.g. through both direct additional employment and indirectly created jobs through UCG sector monies spent locally, including through local procurement. Awareness of shared and common benefits such as all of the above, and through structured CSR initiatives put in development by UCG companies, e.g. that of Five Quarter Ltd and that firm's "long stated commitment .. to establish a charitable trust to invest a portion of future profits into local community organisations, with particular focus upon the former coal mining industries" (Muckle LLP, 2014), could incentivize positive orientations of stakeholders to UCG development in Scotland.

- **Conclusions**

The evidence as to whether the UCG industry can safely focus on public sector (and shareholder, axiomatically and through business as usual operations) stakeholder engagement in the pursuit of its objectives, to the detriment of community stakeholder and in light of the sector's limited budgets for this work, is mixed. Clearly, public sector stakeholder engagement is vital and will require considerable investment of time and resources understanding and responding to policy maker and regulator concerns, and helping to lead both of the same to "better" (including for the UCG company owners) policies and regulations. By deciding to focus its stakeholder engagements and invest monies on public sector engagement that would otherwise be civil society facing, the sector can deploy more resources on a narrower front, perhaps with good results. However, it is a risky strategy, open to out-flanking by motivated, highly-educated and well-connected residents in nearby capital city Edinburgh and its commuter belt, which extends throughout the FoF; the early defeat (No Leith Biomass, 2012) of Forth Energy's proposed Leith (port of Edinburgh) biomass plant, despite support for the biomass sector overall by the Scottish Government, is indicative of the power of Edinburgh residents' opposition when strongly motivated, and the same fate could await UCG if the sector is caught unawares. The alternative approach available to UCG's proponents is broad-front engagement, inclusive of communities, however this also carries the risk of getting "caught in the middle"

(Porter, 1980) and not investing significant enough in any one aspect of the overall stakeholder engagement strategy. Further research is required to better and more conclusively ascertain which strategy is the better one, and whether, indeed, efficacious UCG stakeholder engagement in Scotland can possibly be narrow, but cannot be shallow.

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