

Paper title: The role of local authorities in renewable energy investment: Getting the money to flow.

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Abstract

With three quarters declaring Climate Emergencies, local authorities are seen as key agents in helping to secure the energy transition to meet the United Kingdom Government's Net Zero commitment. Having already committed significant political credibility, local authorities are now seeking ways to finance or enable local actors, including Small and Medium Sized Enterprises (SMEs) and community groups, to develop Renewable Energy (RE) generation. The research presented in the paper aims to address two key questions; firstly, by better understanding the barriers in the investment decision-making process, how can local authorities scale up the deployment of RE projects: secondly, what needs to change to help local authorities and others improve RE investment decision-making?

This paper gathers evidence from published research along with data from a survey conducted in 2020 of RE practitioners drawn from the public, SME, and community sectors. The survey identified a similar suite of RE investment barriers to those found in the published literature, irrespective of sector. Both Community organisations and SMEs face difficulties accessing financing because traditional banks are reluctant to lend based on the borrowing organisation's risk profile. This may be less of a problem for local authorities given that historically they have been considered safe counterparties in financial transactions, although recent as well as long-standing financial pressures may see this position change. Local authorities are now taking on a range of roles in the RE investment value chain to meet local Net Zero commitments. In so doing, councils are encountering new situations where they are taking on more and varied project and investor risks. A key success factor for Net Zero will be how well investors and local actors looking to invest in RE can be brought together in ways that maximize project value.

INTRODUCTION

In June 2019, the United Kingdom became the first country to sign into law a Net Zero carbon emissions target, building on its previous obligated 80% reduction target established by the Climate Change Act 2008. The potential scale of the challenge is immense, with annual national investment estimated at around £50bn to 2050, with currently an annual public investment gap of around £33 billion between currently planned arrangements and

the UK Government's decarbonisation and ecological goals (Committee on Climate Change, 2020; Institute of Public Policy Research, 2020).

In securing the UK Government's Net Zero ambition, local authorities are seen as key agents in their localities, described as *'a cornerstone of climate change partnerships across the country that link key delivery organisations to deliver Net Zero'* (Evans, 2020, p.4). Previous research by the authors (Gudde et al., 2021) concluded that although a significant majority show political desire to play their part, local authorities are taking very different pathways with lack capacity, capability, and coherence to achieve Net Zero at local level in the absence of a formal governance framework likely to significantly hamper success. Encouragingly, there is evidence that an increasing number of local authorities are investing in local Renewable Energy (RE) technologies as well seeking to enable others in their localities to do the same to meet specific Net Zero targets while also looking to create local value, whether through retained investment return and local ownership (Ibid., 2021).

The evidence presented in the academic and grey literature outlined further in this paper shows that many smaller local authorities experience significant barriers to delivering RE projects as new entrants into the energy market. This research presented in this paper, therefore, tries to address two key questions with respect to Renewable Energy (RE) deployment; firstly, by better understanding the barriers in the investment decision-making process, how can local authorities scale up the deployment of RE projects: secondly, what needs to change to help local authorities and others improve RE investment decision-making?

This research builds on the fact that with three quarters declaring Climate Emergencies and now in the delivery planning stage, many local authorities have already committed their political credibility and are now seeking ways to finance their Net Zero action plans. Significant local investment will be needed not only to deliver local-authority commissioned RE projects but also to secure community-wide decarbonisation. This research aims to identify and use learning from other sectors that are similarly looking to invest in RE technologies.

BACKGROUND

The role of local authorities in RE technology deployment

As part of the public sector, Local Government holds a particular and wide-ranging sphere of influence in shaping energy planning and carbon reduction in their localities for the long term. The sector is identified in the UK Government's Clean Growth Strategy as a key agent (HM Government, 2017 p114); *'demonstrating best practice, promoting transparency over emissions reporting and catalysing markets in energy efficiency by implementing measures at scale'* Councils have specific institutional characteristics that place them in a position of authority at the local level; they are set up under constitutional statute and convention operating at the community level; they operate under democratic representation which links their purpose directly to the local electorate; they have longevity and general consistency of purpose, working according to legal powers and duties and functional bandwidth to act in ways to tackle Net-Zero. Local authorities have powers or influence over roughly a third of emissions in their local areas (Evans, 2020). They play three key roles; enabling, advising, and investing in the energy future at the local level, meaning *'that they*

are uniquely placed to contribute, and are critical to meeting the UK's carbon targets' (Tingey and Webb, 2018 p.30). Billington et al. (2020, p.6) concluded that local authorities *"are uniquely placed to help in this process...they have significant powers and responsibilities and control large budgets which they can use to help underpin investment in new infrastructure. They think across the whole economy."* The energy sector regulator, Ofgem (2019), recognises the value of local authorities in the way that they can and should collaborate with other stakeholders in the development of local area decarbonisation strategies and associated investment planning. Others at the local level increasingly look to local government to act in positive ways to facilitate RE deployment. The absence of local authority support, for example, has been seen as a key barrier to the growth of community energy, while partnerships and collaboration with others, including local authorities, are seen to be a key success factor, with their ability to access assets and resources for many community energy groups (Community Energy England, 2019, 2020; Braunholtz-Speight T. et al., 2018).

Local authority investment in RE technologies

Local Government has experienced over a decade of budgetary constraints since the economic downturn of the late 2000s. Although the impact was later in taking effect compared to the private sector, councils have seen an erosion of the traditional funding base of revenue support grant derived from national taxation towards more volatile local taxation and income generation (LGA, 2018). The COVID-19 pandemic has exacerbated the situation, the impact of which on local government finances is immense and far-reaching, affecting local tax-raising, revenue generation, and loss of grant aid (UK Parliament, 2020; Institute for Fiscal Studies (IFS), 2020; LGA, 2020).

Some councils took the opportunity during the 2010s offered by the Feed-In-Tariffs and the Renewable Obligation to invest in RE, in particular solar photovoltaics. For others, however, who were unable or chose not to take advantage of such financial stimuli, entry into the RE market continues to be poorly realised for various reasons, with access to development finance is cited as a major barrier (Evans, 2020; Borrowman et al., 2020; Regen/Scottish & Southern Electricity Networks, 2020). Our previous research showed that progress is more evident in larger metropolitan authorities who are either making or planning significant multi-billion-pound investment over the next 20 years, for example, North of Tyne Combined Authority, West Midlands Combined Authority, West Yorkshire Combined Authority, and Woking Council.

Councils have tended to utilise their own capital reserves, grant funding whether through national or European programmes, or prudential borrowing administered by the UK Debt Management Office (DMO) on behalf of HM Treasury to finance RE projects. Some, more innovative councils have variously utilised generation tariffs, government grants, prudential borrowing alongside their own capital reserves to build their own RE portfolios, for example, Warrington, West Suffolk Council, and West Sussex. A more market-focused model financing the scale of investment required for Net Zero is recognised by the Committee on Climate Change, *"Local authorities are increasingly turning to commercial opportunities to deliver the levels of investment needed to transform their local areas for Net Zero"* (Evans, 2020 p.31). Bristol City Council, for example, has taken an investment prospectus to the

market with an estimated ten-year energy programme portfolio of £875m, with renewable energy valued at £40m.

The model for making investment decisions in the public sector is generally defined by HM Treasury (2020), with the Treasury Green Book setting out the Five Cases model and methodology to appraise policies, programmes, and projects in the allocation of central government funding. Local authorities are increasingly using this as the template for major investment decisions with some of the principles applied in more streamlined decision-making processes where the investment decision is likely to fall within already defined scopes of activity, where the risk and rewards are already better understood, have undergone scrutiny by elected members or defined as decisions which can be made under constitutional delegations. Some of the tools and metrics that public institutions measure the financial and non-financial value of investment-based decisions were identified in our previous research.

Barriers to Renewable Energy deployment

Both the academic and grey literature highlight the challenges faced by organisations looking to deploy RE technologies. Brummer's (2018) overview of research focused on social renewable energy projects in the United Kingdom, the United States and Germany, provides a basis on which to consider the barriers faced by local authorities. Weber (2017) categorized the barriers encountered by RE as follows: those arising from the impact of political institutions, national government, and local authorities; obstacles conditioned by the market, market barriers or market failure; and barriers within organisations. Jordan et al. (2014, p.316) identified five major barriers holding back RE innovation investment by Small and Medium-sized Enterprises (SMEs) in Germany; "*deficits in innovation culture, inter-firm cooperation along the value chain, finance, awareness and take-up of government funds*". Saunila et al. (2019) outlined some of the factors driving organisations toward investing in clean (interpreted in this research as renewable) energy technologies, including such as environmental regulations, environmental commitment, customer pressure, managerial concerns, and cost savings.

RATIONALE FOR THE RESEARCH

As local authorities seek ways to fund RE deployment, whether in their own estate or working with others, many will experience steep learning curves with respect to their understanding of the RE technologies, the financing options, and how the capital markets operate. This research aims to explore the process by which local authorities develop RE business cases in which some may be entering into new areas of knowledge and competence from an investment as well as an RE technology perspective. The research has considered two methodological approaches within a pragmatic research philosophy; firstly, data and findings reported in the published academic and technical literature; secondly, using an attitudinal survey of local authority and non-local authority RE practitioners. A third stage, using qualitative interviews with local authority practitioners, is planned which will inform the analysis presented in this paper and, subject to the findings, explore the need for a new way to model the RE developer-investor decision-making process. This mixed method approach was chosen as a way of allowing comparison across a range of data sources whilst recognising the limitations set out below.

METHOD

Identification of background literature

A scoping literature search was undertaken using the EBSCO (University of East Anglia) search engine to identify published academic and grey research dealing with the investment decision-making process in the context of RE technologies. The search was then extended to gather relevant technical grey literature. Citation chaining techniques were used to expand the scope of the search. The search was not confined to RE technologies to bring in wider contextual material, in particular economic market theory and governmental policy.

The literature was then reviewed to collate research engaged with participants in the investment process, ranging from investors, academics, energy project developers, amongst others. The research literature identified comparable practitioner surveys in other societal sectors (n=21), targeting the community sector and Small and Medium-sized Enterprises (SMEs). The research findings were used to inform the adopted survey approach and provide data and information against which any resultant data could be compared.

Survey of practitioners involved in energy technology deployment

The survey process was designed to draw meaningful conclusions on the commonalities and differences of approach to RE investment decision-making in a range of sectors to inform how local authorities approach RE energy projects. A survey protocol was prepared based on the Rapid Evidence Assessment (REA) principles and approaches advocated by the Center for Evidence-Based Management (CEBMA, 2017). The survey gathered the views of RE practitioners. A questionnaire was compiled using insight gathered from the literature review, along with the practical experience of the research team. Following academic ethical approval, the questionnaire was trialled with a sample of organisations drawn from the public, business, and community sectors. Following the feedback, the questionnaire was revised and then posted online using the digital survey software, *SmartSurvey*.

The online survey targeted three specific societal sectors to allow their comparison. Together, they demonstrated a wide variation in the population size ranging from Local Government (n=343), the third sector with the best estimate of voluntary and charitable organisations taken as the notional population (n=circa 167,000) and the SMEs (n=circa 5.9 million). The literature review of previous studies demonstrated no consistency of sample size or sampling strategies. Also, given that there is no available data to show how many people are involved in RE projects in the UK, defining the population size was considered impractical. The researchers chose not to include a control group since the research aimed at soliciting views from practitioners, not the general population.

A mixed communication approach to promoting the survey was used with access to the survey sent through intermediaries, social media, and directly to potential participants in the three sectors identified through contacts of the research team with the aim of attracting a sufficiently meaningful sample size of responses. No financial incentives were offered to encourage participation since it was hoped that this would be achieved by explaining the purpose of the research along with the intention of sharing the key research findings. Individuals from the same organisation were allowed to participate since the research was designed to capture a range of views and attitudes from those involved across the RE

investment decision-making process. Furthermore, a decision was taken to include responses from those who were delivering RE projects even if they stated that they did not have a significant role in the investment decision-taking since their involvement will still have informed the investment decision. These equated to approximately 10% of respondents (n=7). Participation by individuals within established energy sector organisations was avoided to target local delivery. The survey was published online between February and August 2020. Uptake was monitored, and additional promotion of the survey was undertaken during this time. Data was extracted, partial responses removed, and the resulting data transformed using basic statistical techniques. The comparison was made between the survey results and the published literature; in particular, two published surveys, the PwC & Energy UK 2019 B2B Survey of public and private sector organisations (n=504) and the 2020 Community Energy England (CEE, 2020) State of the Community Sector Survey of community energy organisations across England, Wales and Northern Ireland (n=300).

Research limitations

Given the nature of the populations that were sampled and the qualitative nature of the data collected, it was accepted that the research process was vulnerable to bias. As Norris (1997, p.173) says, *'most of the conventional constructs of validity are inappropriate for naturalistic forms of inquiry'*. The study was based on a scoping literature review which introduced a bias towards the evidence discovered at the time, with the findings being treated as at an interim stage pending further research. The adopted sampling strategy could not guarantee a quantifiable participation rate. An attempt was made, therefore, to identify, assess and plan to mitigate the potential impact of bias in this research with the production and application of risk identification and mitigation strategy as part of the survey protocol. However, the timing of the survey coincided with the start of the COVID pandemic; this was considered to have contributed in some measure to a lower-than-expected participation rate.

RESULTS & DISCUSSION

Barriers to RE technology deployment

The online survey findings identified a similar suite of barriers to those found in the published literature. In response to the survey question, *'what are the greatest barriers to your organisation's investment in energy technologies'* non-local authority respondents (n=26) placed the up-front cost of technologies highest, followed by lack of affordable and accessible finance and project complexity. Local authority respondents (n=34) ranked complexity highest, followed by technology and grid connection costs (Fig.1).

The PwC-Energy UK survey showed that for SMEs, the up-front RE technology cost was the biggest barrier to RE investment, with 33% of respondents ranking it highest (n=41). In comparison, the Community Energy England survey (CEE, 2020) reported lack of organisational capacity, removal of the Feed-in Tariff for RE power generation, and time constraints as the three most significant barriers to RE project development while, surprisingly, lack of funding and access to finance ranked fifth and eleventh respectively.

Taking a wider energy perspective, the PwC-UK Energy survey revealed that energy price concerns dominated all participating organisations. Of the SME sub-category (n=124), 46%

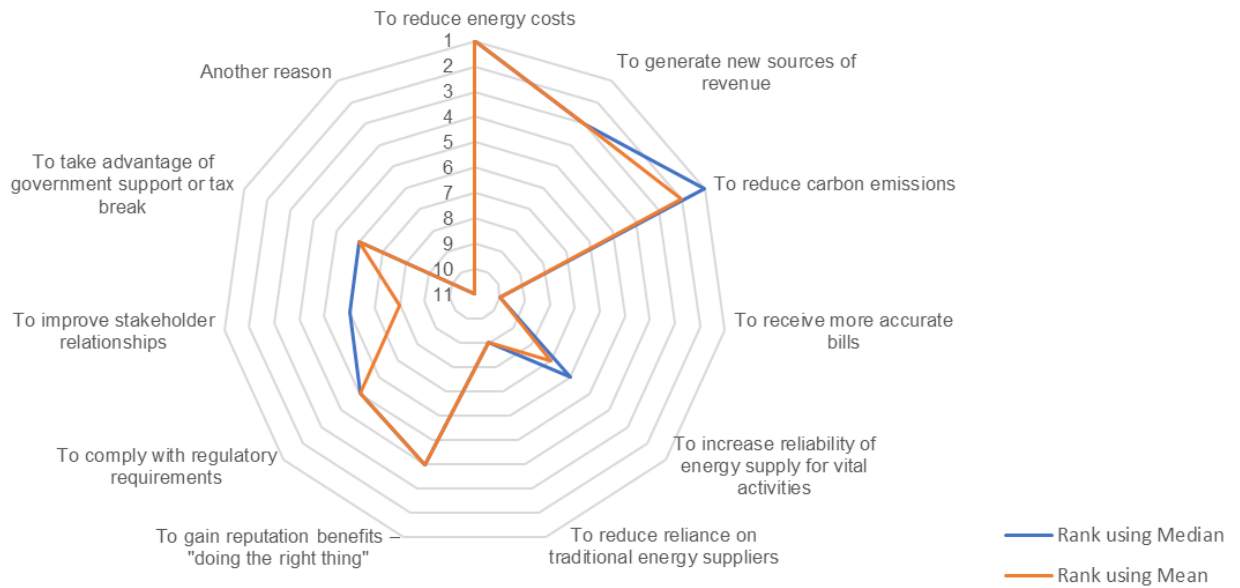
identified energy costs as most important, which led the authors to conclude that *'the aim of energy management is most likely to reduce cost'* (PwC-Energy UK, 2019 p.12). In contrast, 56% (n=20) of participating local authorities ranked energy costs highest, with the report concluding that *'with strained public local funding, energy prices (and taxes) form almost all concerns'* (ibid. p.12).



Fig 1. Rank order of barriers identified by local authority representatives in response to the question, *'what are the greatest barriers to your organisation's investment in energy technologies?'* Rank order from highest (1) to lowest (12) importance.

Access to cheap capital is seen as a more significant barrier to energy projects in the community sector and for SMEs, observed both in the survey data and the literature. That non-local authority organisations developing RE projects appear to find the financial barriers more significant than local authorities could be explained in several ways; it may be that affordable capital is more easily available in the public sector than for community groups and small businesses. This is likely to be the case since some councils can call upon capital reserves, which may be under-performing as investments. Secondly, in addition to or in the absence of their own capital, local authorities can utilise the Public Works Loan Board lending facility with lower interest rates and generally longer repayment terms compared to commercial equity lenders.

When asked *'what are the greatest influences on your organisation's energy investment decisions,'* local authorities (n=34) ranked reducing energy costs and carbon emissions of equal highest importance followed by the reputational benefits (Fig. 2). The picture was very similar across non-local authority organisations who ranked energy cost savings slightly ahead of carbon reduction followed by gaining reputational benefit (n=26).



n=34

Fig 2. Rank order of influential factors offered by local authority representatives in response to the question, 'Which of the following factors would have/have had the greatest influence on your organisation's energy investment decisions?' Rank order from greatest (1) to least (11) influence.

Barriers to RE investment

Community organisations face difficulties accessing initial financing because traditional banks are reluctant to lend based on the borrowing organisation's risk profile. Community organisations do not tend to have the level of capital required to self-finance the development with no prospect of refinancing once the project has been successfully completed (Brummer, 2018). SMEs were seen to face similar issues with "greater difficulties to access funding, loans and contracts than big companies" (ibid, p.193). This may be less of a problem for local authorities given that historically they have been considered safe counterparties in financial transactions due to their low risk of insolvency and statutory status ensuring that they are unlikely to cease to exist. This situation may change, however, given the long-standing financial pressures faced by the public sector since the global downturn of the previous decade and, more recently, the COVID pandemic.

UK:100 (2019) found that some progress was being made by local authorities looking to identify ways to finance the Energy Transition, highlighting policy changes in part driven by the UK Government Clean Energy Strategy, emerging delivery and support for local authorities as well as evidence of local action by local authorities working in collaboration with other parties with interests in local energy. Our previous research, however, revealed significant variability in commitment to investing between smaller and larger local authorities (Gudde et al., 2021).

Methods used to assess RE project performance

The researchers (Gudde et al., 2019) previously identified and outlined the range of performance modelling and measurement tools to assess project performance applicable to

RE technology deployment. Our analysis suggested that more traditional techniques and metrics are most likely to be called upon. The online survey findings appear to bear this out, with participants tending towards relatively simple performance metrics and project assessment tools with Payback, Internal Rate of Return, and cash savings or revenue generation being most prominent (Fig.3). Carbon and energy savings were identified by local authorities as key non-financial considerations and of slightly greater importance to financial performance."

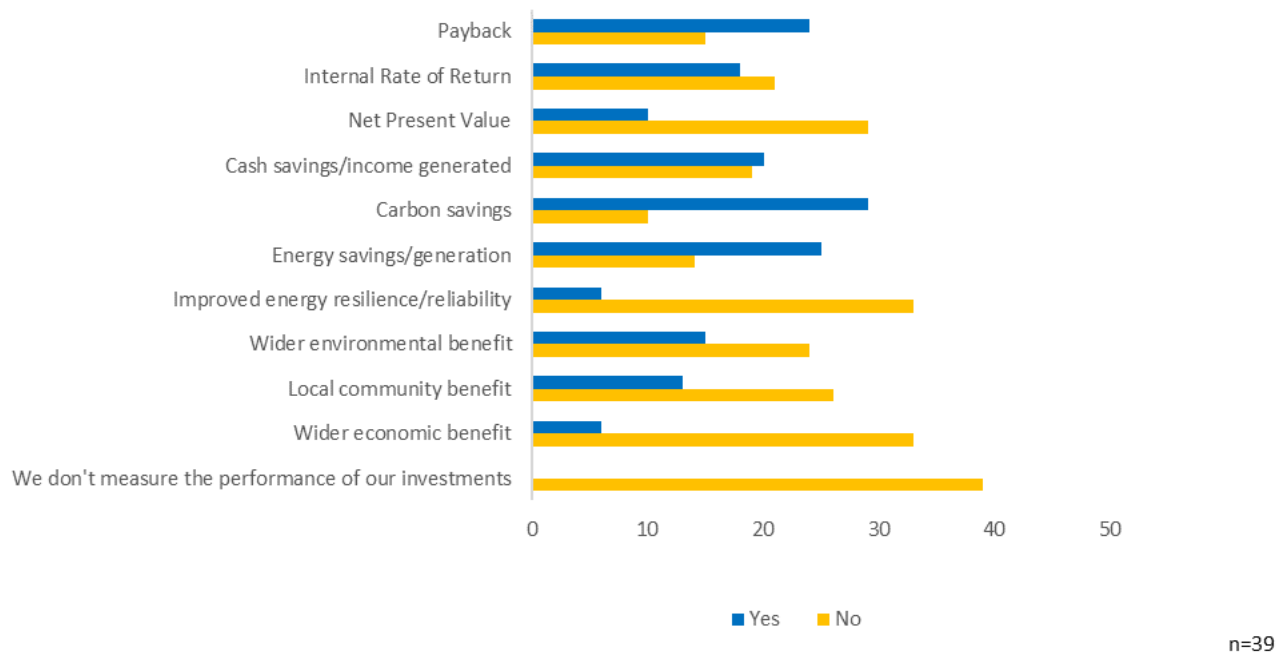


Fig.3. Responses provided by local authority representatives in response to the question ‘How do you measure the performance of your energy technology investments?’

The survey results showed some evidence that the public sector was more familiar with project modelling tools than the other sectors, although there was no unanimity (Fig.4).

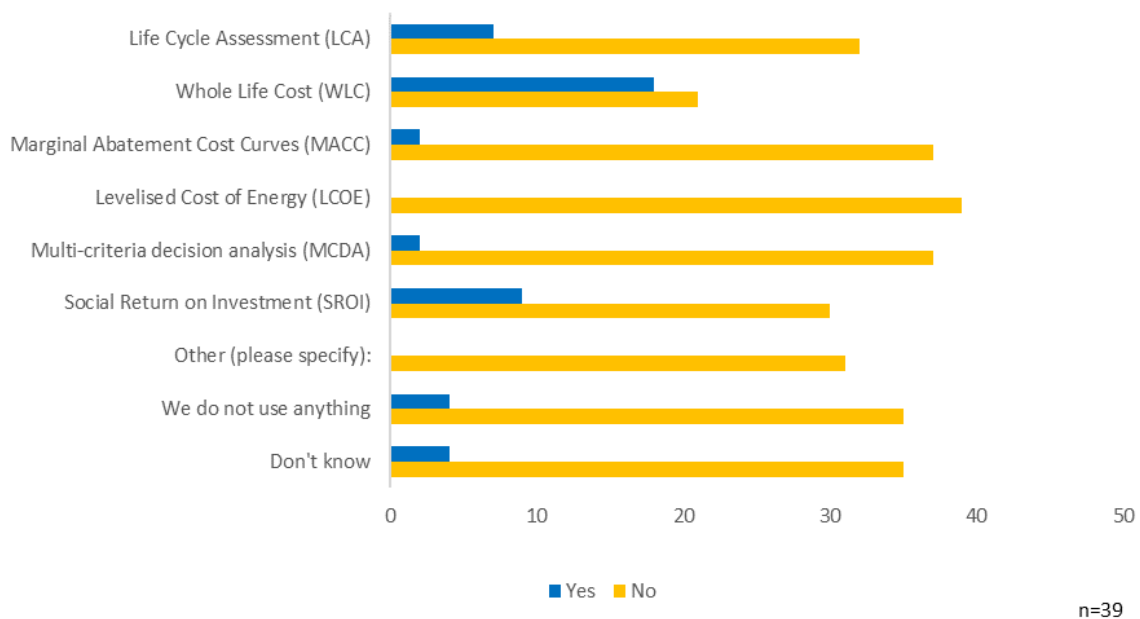


Fig. 4. Responses by local authority representatives to the question ‘Do you use any of the following performance modelling tools when assessing investment in energy technologies?’

Whole Life Cost techniques scored higher than other tools (n=24), in particular Social Return on Investment (n=13) and Life Cycle Analysis (n=12). Nineteen respondents did not identify with the Levelised Cost of Energy (LCOE) approach to assessing projects. Respondents stated that either they did not use any modelling tools or did not know about their application. Other methods were suggested by respondents, including techno-economic modelling, some form of carbon abatement (not explained further in the response), and Internal (organisation-specific) financial cost-benefit modelling. This is interesting given that academic literature has shown increasing focus on multi-criteria decision making (MDCM) although there appears to be a lack of recognition of such methods in any of the surveyed sectors.

CONCLUSIONS & POLICY IMPLICATIONS

This paper brings together insight drawn from the academic and grey literature and a practitioner survey to explore the challenges that United Kingdom local authorities are facing as they endeavour to make decisions to invest in Renewable Energy (RE) technologies.

Many local authorities that have declared a Climate Emergency and set a Net Zero target are now trying to establish a pipeline of investable projects in their own local area. Some are taking on a range of roles in the investment value chain, from signposting local RE developers to funding and finance, taking their own investments in local RE projects through to developing new investment vehicles. In so doing, councils are experiencing new situations where they are taking on more and varied project or investor risks.

A key success factor for Net Zero will be how well investors and RE project developers can be brought together in ways that maximise project quality, scalability, and deliverability to meet a timescale compatible with their Net Zero target. Local authorities may need to draw upon solutions from other sectors, developing investment-market focussed RE portfolios, finding new ways to match RE developers with land or building asset owners, or developing trading platforms to stimulate RE investment. However, the risk aversion exhibited by smaller local authorities in particular, due to their immaturity in the understanding of RE technologies, the energy system, and the investment options beyond their use of capital reserves or PWLB lending, will continue to constrain locality-wide RE deployment. This could be overcome by smaller local authorities collaborating across wider geographies, with specific public, private and third sector delivery organisations which will necessitate developing appropriately robust policy and contractual arrangements.

Local authorities operate within a political domain bound by democratic processes for decision-taking. Local politicians decide whether or not to support RE investment decisions based on the business cases presented to them by their council officials who, knowingly or otherwise, will have been influenced by the experiential and behavioural biases of the actors who have taken part in the construction of that business case. Those same politicians will be faced with a personal decision when voting on an RE proposal based on their understanding of the options put in front of them, their political affiliations and allegiances,

and their own experiential and behavioural perceptions. Acknowledging these factors within the investment decision-making process is a hard but necessary truth with which policy makers and RE delivery planners will need all the tools available to them to achieve Net Zero localities.

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