



Local Supply Communities

*Phase 2
Abbreviated Report*

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About Pixie Energy

Pixie Energy is an advisory and services company established by Cornwall Energy founder Nigel Cornwall to progress local energy market ideas and initiatives. The company's primary focus is the Local Supply Communities project, which started with work on how to structure local tariffs and the relative costs compared with national supplier offerings, and has progressively been refined through work supporting local stakeholders on both sides of the market on understanding access options and valuation optimisation, including regional consolidation under innovative supply structures.

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Abbreviated report

1. Executive summary

Local electricity markets have the potential to help drive the transformation of the GB electricity system, in terms of delivery of energy and climate change policy objectives and creating benefits for key stakeholders, including consumers but also local authorities (LAs) and community based groups such as Social Housing Associations (SHAs). These benefits could be considerable and range from increased system flexibility and resilience, to cost reductions and lower electricity bills, to enhanced competition and rebuilding trust in energy markets, to increased social capital (including increased energy literacy and local democracy).

This is the report from phase 2 of Pixie Energy's Local Supply Community (LSC) Project, which has been the analysis phase (which in turn followed a scoping and definition phase). We intend to continue our work but, before we do, we are summarising the position we have reached to gauge reaction to our findings, and to feed them into the current work of the Government in this important policy area.

This analytical phase has confirmed the feasibility of developing and expanding local electricity markets, with development of virtual case studies in three different electricity market settlement¹ regions loosely matching demand and supply. In each case demand was intentionally based on LA consumption, given their wide-ranging energy interests. In the immediate context of this report, their consumption could provide stable and secure demand for local producers with low-carbon generation and enable the offer of bespoke local tariffs. However, more generally, they have a unique position in the local community as providers of infrastructure and energy-related services, and could be regarded as a key enabler of local market development.

Project participants agreed that technological change already taking place in the electricity sector should continue to enhance the viability of local electricity markets. These could embrace a draft of new and innovative technologies – from the digital, smart grid and appliances of the future, to electricity storage technologies, further development of heat networks associated with generation, demand-side response models and IT developments such as blockchain technology.

Nonetheless, the Project also agreed that in the assessed case studies the business case for such models was not proven at the present time, and the barriers to the growth of local electricity markets were high. Despite a policy framework that over recent years has expressed support for community energy schemes and local supply, such initiatives were far from becoming mainstream, and indeed were becoming less frequent. Pilot schemes underway were small and very different, and had not attracted meaningful LA attention.² It was also noted that there was a growing consensus that policy and regulatory change needed to take place to deliver innovation and a smarter system.

The Project identified a range of existing barriers to development, notably regulatory structures and market rules, designed at the national level for a different era and generally

¹ The electricity map of GB is divided between 14 settlement zones. The three within this phase of the project were Eastern, South Wales and Yorks/N Lincs.

² In this context, the Project participants noted other recent pilots and projects that were exploring related local market approaches, from a small matching scheme in North Wales based around matching hydro output with local domestic properties, to a large pilot that has just been launched in Cornwall, which we reference below.

supporting scale players. These applied across the market place – across energy trading arrangements and network charging rules (both transmission and distribution). Furthermore, some of these barriers had been getting higher, and a range of recent Government and Ofgem interventions have had highly negative effects on the financial feasibility of community schemes and local energy markets. There were also a number of informational hurdles, and few real attempts have been made to trial innovative solutions in this complex area.

This deteriorating position was coupled with wider market changes in wholesale electricity prices, which is tending to make the traditional utility model based around national supply more attractive because it plays to the strengths of large, well-capitalised players who can contract forward and stabilise pricing. Security of supply has also been a major and increasing focus, driven by National Grid, and this has led to a focus on demand-side management opportunities rather than local electricity markets. Perversely the expectation of significant change to market rules tomorrow was also considered to be holding back innovation today.

The Project has therefore concluded that, without a new and significant policy and regulatory focus on supporting the growth of local electricity/energy markets, their benefits could and would not be fully realised. As a result the opportunities provided by new technology, innovation and changing customer behaviour would be significantly under-achieved.

On a more positive note, LAs are continuing to widen and deepen involvement in energy-related activities. In some high profile cases, this has involved energy supply, although these examples have diverse motivations. However, LAs will continue to have a unique interest in energy services and they could be expected to continue to review market opportunities, including the prospects for local electricity markets, going forward not least to identify new revenue earning opportunities in the face of significant funding cuts.

This report makes recommendations with regard to:

- Building on the knowledge gathered during this phase of the Project and disseminating it among LAs and other stakeholders to highlight emerging opportunities
- Moving from this analytical stage of the Project to a detailed regional feasibility study in the East of England based around energy innovation parks and local markets
- While we have already identified some financial and practical support for this next phase, involving a range of local stakeholders including from some participants from phase 2, a key step would be applying for funding being provided through Ofgem/BEIS to support innovation and possibly European Regional Development Funding
- Continuing to engage with policy makers and regulators to build understanding of barriers to local electricity markets, including the risks arising from the on-going reviews of embedded benefits and network charging
- Maintaining and building the wider network of participants and stakeholders we have established around the Project to continue to advocate the merits of local electricity markets.

In the first instance we will feed our findings into the smarter markets and low-carbon work-streams that are presently underway, including BEIS/Ofgem's call for evidence that closes on 12 January 2017, the industry strategy consultation expected from BEIS and the Emissions Reduction Plan promised by the Government, both expected in the Spring.

2. The Local Supply Community Project

The Local Supply Community Project (the Project) was established in 2015 to explore the concept of linking exports from distribution connected (or embedded) generation and local consumption of electricity, specifically that associated with LAs. The project was specifically designed to explore this innovative supply concept under different regulatory and contractual structures. It has drawn on earlier extensive analysis by Cornwall Energy carried out for (among others) Elexon on local balancing and local tariffs.³

This is a report on work under phase 2, which is the analysis phase, which commenced in Spring 2016. The Project during this phase has explored the case for local electricity markets, examining a number of representative regional schemes or case-studies that matched, where feasible, low-carbon generation and LA demand, with the LA acting as its own supplier. Matching in this way is critical in the existing electricity market where “balancing” is strongly incentivised and costs loaded onto out-of-balance parties. Local balancing can help avoid these costs, and by sharing in sources of value between the participants in different ways to established routes to market, potentially enabling local entities to compete with national ones.

This report sets out our findings, conclusions and recommendations from phase 2. It has been funded by contributions from a range of stakeholders, but notably Engie, Haven Power, Local Partnerships and Cornwall Energy. A range of generation developers, suppliers and LAs have also actively participated in it, under the direction of a monthly Project Board meeting since April 2016.

The Project Board is chaired jointly by former energy secretary of state Sir Ed Davey and Nigel Cornwall.

3. Policy context

The over-arching goals of energy policy have been constant for well over a decade and remain in place – namely the “trilemma” of maintaining energy security, tackling climate change by decarbonising the sector and keeping costs down for consumers. Some would argue that during the Cameron administration’s tenure, the then secretary of state Amber Rudd in effect demoted the low-carbon objective, placing much greater emphasis on affordability and security of supply. The May administration has also recently varied its stance, adding to this listing the promotion of innovation within a framework that supports industrial strategy at both the national and local levels. It is also showing increased levels of interest in the role of renewable heat, which has a real local dimension, with the November 2016 heat call for evidence.⁴

Over the life of the Project to date, policy change has continued apace. The focus of the Cameron administration’s work was the Community Energy Strategy, initially published in January 2014⁵ but updated in March 2015.⁶ This strategy explicitly recognised the potential role of LAs in this area. Writing to local authority leaders highlighting publication of the strategy, Ed Davey noted: “Local government is uniquely well-placed to support, partner and

³ https://www.elexon.co.uk/wp-content/uploads/2015/03/Encouraging-local-energy-supply-through-a-local-balancing-unit_March2015.pdf

⁴ <https://www.gov.uk/government/consultations/heat-in-buildings-the-future-of-heat-non-domestic-buildings>

⁵ <https://www.gov.uk/government/publications/community-energy-strategy>

⁶ <https://www.gov.uk/government/publications/community-energy-strategy-update>

invest, and to provide a positive planning and policy environment to help drive a community energy revolution. Local authorities know the problems, opportunities and stakeholders in their area best and can work as a trusted voice. DECC is committed to a sustainable and significant expansion of the sector in the years ahead and local leadership will be key to helping deliver community energy projects across the country.”⁷

The current administration says it is also committed to supporting the development of community-led energy, local supply and decentralised markets. Indeed, the November 2016 Call for Evidence for a “smart flexible energy system”⁸ suggests some thinking is now being given to how distributed power systems based around local participants will work in the future as part of a reformed market and operating model. Further, while the Government recently acknowledged that the Community Energy Strategy will no longer be updated, it is looking to engage with relevant stakeholders around the issues as it prepares its Emissions Reduction Plan due in Spring 2017.⁹

Opposition energy policies are also converging. In a September 2016 update the Labour Party’s Jeremy Corbyn made a high-profile speech that called for a local renewable energy plan, noting: ‘Denmark and Germany’s decarbonisation experiences show clearly that an effective and successful energy transition must be bottom-up as well as top-down - and that local energy co-ops can be an ideal way to drive this.’¹⁰ Local energy also builds on the Labour manifesto call for a “democratisation of energy”.¹¹

In summary, despite some green shoots, the Project concluded that the gap between policy and stated desired outcomes on the one hand and practice on the other has become very wide. Nevertheless this developing policy context looks as if it has the potential to build on the policies of the Coalition Government with respect to boosting community energy and local supply as elements of a smarter system. We are hoping this report will form a meaningful contribution to this policy development work across party-political boundaries.

4. Benefits of local markets

The benefits of local markets are multi-faceted and potentially very significant. Indeed the potential economic and environmental benefits they offer should be growing given technology change and the increasing policy emphasis on smart, decentralised solutions and on innovation. They also offer less tangible but no less real benefits around social capital and community engagement, autonomy and control.

The benefits would arise in a variety of different ways and are diverse, but may include:

- Unlocked opportunities for emissions reductions (including local air quality improvements) and lower energy bills that would otherwise not be realised

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304795/20140127_Edward_Davey_Mike_Jones_letter_to_LAs_on_CES.pdf

⁸ <https://www.ofgem.gov.uk/publications-and-updates/smart-flexible-energy-system-call-evidence>

⁹ <http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Lords/2016-11-29/HL3642/>

¹⁰ http://www.huffingtonpost.co.uk/leo-murray/jeremy-corbyn-climate-change_b_12004024.html

¹¹ Corbyn noted in a September 2016 *Guardian* article that locally-run publically-accountable energy schemes will provide the public with more power and a greater say over its energy mix: <https://www.theguardian.com/environment/blog/2016/sep/07/why-labour-is-putting-energy-reform-at-heart-of-its-green-agenda-jeremy-corbyn>

- Other LA benefits that might include a long-term contracting framework and more stable power bills, local supply diversity and greater resilience - as well as cost reductions, which could be shared with customers where a LA has them.¹² A recent study by APSE suggests there are valuable knock on benefits to the wider local economy, boosting competitiveness and growth, including job creation¹³
- Reduced costs of operating the GB networks at all levels. Many schemes may only use a limited part of the distribution network, but do help to reduce distribution network losses, and they could also reduce the need for future upstream network reinforcement, especially if generation is targeted at areas identified by distributors (DNOs)
- Significantly contributing to the flexible system that policy makers and energy industry stakeholders are committed to achieving. By facilitating and incentivising the deployment of new smart and storage technologies, local markets could make a significant contribution in helping drive smarter, more flexible systems.

The model based on LA supply could also deliver additional benefits. In summary we believe that for every 1% of combined LA demand that is sourced from local generation or self-supplied there could be:

- £500k of savings annually on the electricity procurement bill
- Over 24MW of additional low-carbon generation could be underwritten
- More than 90,000 tonnes of additional CO2 abatement could arise annually
- £850k released into the local economy each year.

The rationale for this assessment is based on analysis of the DECC/ BEIS DUKES dataset¹⁴, relevant claims from the Crown Commercial Service DSR tender¹⁵, and Cornwall Energy assessments.

5. Barriers

As yet there have been few real cases to test the magnitude of these opportunities in the marketplace; and none at scale, though a new pilot has recently been announced that will test a regional market with a utility player acting as a consolidator and operator of smarter network solutions.¹⁶ We also reference a number of other local initiatives in the report, including the National Trust/Co-operative Energy backed local netting scheme at Bethesda in north Wales¹⁷, as well as some “peer-to-peer” trading platforms currently being tested.

¹² For instance, LAs with social housing interests or looking to offer supply these and other vulnerable customers can transfer capture of value streams into lower tariffs for such targeted customers.

¹³ <http://www.apse.org.uk/apse/index.cfm/news/2015/municipal-energy-ensuring-councils-plan-manage-and-deliver-on-local-energy/>

¹⁴ <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>

¹⁵ <http://ccs-agreements.cabinetoffice.gov.uk/contracts/rm964>

¹⁶ It is relevant that Centrica announced on 4 December 2016 the launch of a project with other industry principals based on assessing the feasibility of a local market in the county of Cornwall (“the Cornwall Local Energy Market”). This will among other things test the use of flexible demand, generation and storage across both the domestic and business sectors in the region. It is funded jointly by Centrica (£6mn) and the EU European Regional Development Fund (£13mn). For more, follow this [link](#).

¹⁷ <http://www.bbc.co.uk/news/uk-wales-38290899>. The project requires the involvement of an established national supplier to “sleeve” the power as well as certain derogations from current settlement rules.

The Project found that the barriers to development of local electricity markets remain significant. The **market rules remain national in scale and scope**, and they penalise regional imbalances.

The Project identified many other barriers to development. Depending on the business models being proposed, **these barriers can be due to unfavourable market regulation, an unsuitable policy environment, an unproven track record**, which is in turn compounded by the fact that many of the technologies, and many **demand-side techniques have yet to be tested in a local setting**.

It is clear that regulatory barriers are a real issue, as we explain further in section 7 below, but by no means the only one. Some of these can be at least partially addressed through building and transferring local knowledge and capability. Our analysis based around a LSC model also shows that the economics have deteriorated and the business case with it. But there is an interaction between many of these factors and, while experience of non-traditional business models remains limited, perceptions of risk will remain high and even robust schemes will not be replicated.

Over the life of this project, a number of changes in policies and regulatory rules have meant the prospects for LSCs have diminished. These include the introduction of more marginal electricity imbalance prices, which have increased peak prices and volatility, and the removal of a premium for green power¹⁸ and reduction or cutting of other sources of value from the market especially under low carbon subsidy schemes¹⁹

The wider implications of this change, including impacts on local system resilience, and the value of local generation to the distribution system, which can be positive, have not been considered as part of the regulatory review process to date, but an impact assessment should be available early into 2017.

6. Project deliverables

The Project identified a number of outputs during this analysis phase, and these have been delivered. **They have also been discussed with participants as the Project progressed and learnings disseminated.**

The full report and supporting analysis illustrate how a LA or LAs acting together can match different low-carbon generation assets in an area with local authority demand. Using three regional case studies based on benchmarked generation costs and representative LA demand data, the report shows how this might be developed as an alternative to traditional power purchase agreements (PPAs) using different supply structures, regulatory and commercial approaches and what the associated revenues and costs might be under each. The three regions were Eastern, South Wales and Northern, and each used different combinations of generation.

The full report specifically considers business structures based on:

- Direct supply either to the LA or its customers, with a new entity – “the LSC” - holding its own supply licence

¹⁸ The “green premium” was associated with the Levy Exemption Certificate that was issued for each MWh of electricity and which could be used by a supplier to claim an offset against power supplied to business customers to reduce liability under the Climate Change Levy.

¹⁹ The Renewables Obligation is to close from 31 March 2017, and many FiT payment rates for most qualifying technologies have been subject to significant digression.

- The so- called “licence-lite” approach (where the LSC would be the junior supplier contracting with an existing senior supplier who would deal with central systems and traded markets on its behalf)
- Given current interest in the market in partnering approaches, we also look at “white label” arrangements.

We have also set out the key elements of the “toolkit” – legal, regulatory and commercial elements of the frameworks needed to deliver LSCs under these different supply routes, recognising that in the current environment few LAs are likely to use them.

We also considered other routes to market other than through supply for local generation.

Off-grid or **private wire arrangements**, which are seeing increasing take up, including several high-profile projects involving LAs, are also considered. However, we believe these are often seen as having merit for the wrong reasons. For instance, **while sponsors can avoid policy costs levied through public supply and system costs levied on suppliers, they also duplicate the existing network**. Ofgem recently flagged this area as one of concern²⁰, and we are expecting that over time there will be increased scrutiny of such arrangements.

Hybrid arrangements are also described, including “**sleeving**” arrangements, which in effect is a negotiated model already established in the market place that contains many elements of the licence-lite approach, but is formalised through contracts rather than under the new junior licensing route. **However, we are not aware of any such arrangements presently involving LAs**, though their collective purchasing should mean that they would have leverage in negotiations with established suppliers if they wished to test this route.

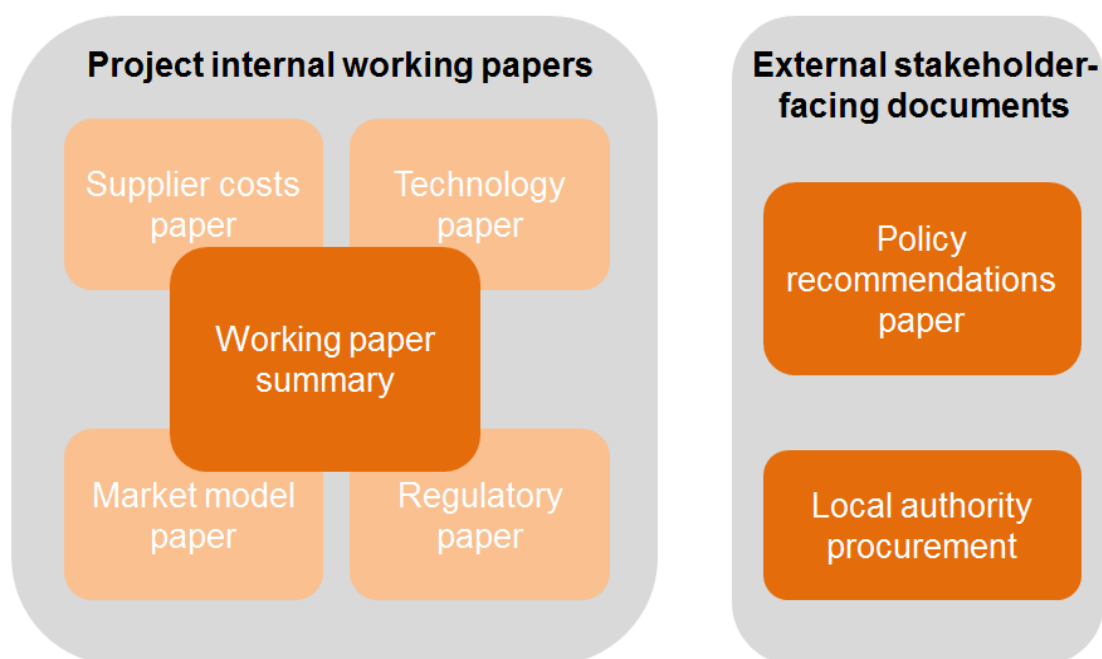
The analysis phase also incorporated development of four distinct modules that each culminated in an internal working paper, outlined in Figure 1. The summary document also outlines the key findings of each of the papers.

The working papers, which are available to the Project participants, are:

- Supplier costs – the expected costs of establishing and operating a supply business including the expected customer numbers to break even
- Technology – the costs and revenue streams available to demand-side response (DSR), storage and electric vehicles, and how these technologies might integrate in local supply communities
- Market model – this paper outlines the rules and principles within which market participants must operate, including the supplier hub principle, summarises the various local market structures in operation and suggests ways in which a local market may operate
- Regulatory interactions – outlines some of the big regulatory changes in the market currently and notes how policy and regulation frequently alter, causing large shifts in the value available to small-scale renewable generators and other market participants.

²⁰ “We have considered that changes to embedded benefit arrangements could lead to unintended consequences since it may push more connection of generation behind the meter or connection via private wires, which is likely to lead to inefficient outcomes. This is an important issue that will aim to take into account in future related network charging work.” Open letter on embedded benefits, dated 29 July 2016.
https://www.ofgem.gov.uk/system/files/docs/2016/07/open_letter_-_charging_arrangements_for_embedded_generation.pdf#page=1&zoom=auto,-22,842

Figure 1: The LSC project modules



The full report provides an overview of the work undertaken in each work stream and summarises the findings from the working papers.

Two other documents were also produced for dissemination with external stakeholders:

- The policy recommendations paper, which has been incorporated into this executive summary
- The LA and energy procurement paper outlines the current process by which the majority of local authorities procure energy through public buying organisations, the rules that determine how they must procure and some commentary and recommendation about how these rules could be changed to achieve an overall lower energy bill and contribute to participating in local markets and energy security.

7. Main conclusions

Our modelling showed that **the key determinant of the viability of the local balancing or LSC approach is not the chosen supply route but the extent of the volume imbalance** under each of the case studies. Another significant factor was the ability of the supply entity to hedge its imbalance risk on traded markets (either in its own right or through an agent). Even with rising or high wholesale prices, our modelling suggests imbalance and a limited ability to manage it **creates a real barrier to local markets, under current policies and market rules.**

According to our modelling - which looked over an 18 month period - the *only* point at which the modelled costs of supplying customers was lower than the average one year acquisition contract for a comparable customer observed in the market²¹ was in Q116. At that point wholesale prices were at their recent lowest, having consistently fallen for over a year. But this relatively better position could only be achieved where generator revenues fell in line

²¹ Profile class (PC) 4, which includes most LAs. For the purposes of the comparison we used SME price benchmarks developed and maintained by Cornwall, based on its quarterly reports of supplier offerings.

with market prices; were that not to be the case, the local supply tariff would even then have remained above the benchmarked market price.

From spring 2016, wholesale prices (especially forward prices) began to recover, and through the summer and autumn increases picked up pace as concerns prevailed about security of supply during winter 2016-17. Assumed generator revenues have increased but the costs of hedging and dealing with local imbalances have also increased, meaning the calculated local tariff remains above benchmarked market prices.

So, the findings of our modelling suggest that, today, **the local supply entity could only beat prevailing acquisition tariffs in very specific circumstances** and even then only in a falling market where generator revenues were also reduced. Growth opportunities would be extremely limited. In all modelled cases the relevant local supply entity would struggle to match currently available national tariffs, and in many cases could not, where imbalance volumes increased. This is a particularly important variable to local electricity markets given the intermittency of many of the existing energy assets at the community level, and in a market environment that is national in scope and large in scale.

At one level this is not surprising. The “law of large numbers” means that from a purely statistical point of view the proportionate level of imbalance will be less if averaged across a wider group of customers and generators. This law ignores what is assumed to be one of the primary benefits of local energy, which is the additional motivation that might exist for local customers to actively try and match their demand with “their” local energy. However, there have been few local energy pilots to date, and hence there is limited evidence of how material this effect is. Absent of any allowance for this effect in the modelling, **it is inevitable that local imbalance costs will be higher than those for a larger national player, and the gap is increasing** as energy imbalance costs become systematically more volatile under industry rule changes.²²

This negative result could have been different – but for policy changes in the last two years: the abolition of the levy exemption certificate, the dramatic reduction in support levels for renewables, the abolition of EIS tax relief and Ofgem’s recent decisions to adopt change that will reduce embedded benefits are the main examples of how the economics of local electricity markets have deteriorated, even before changes in market conditions are taken into account.

Given the current policy environment, the key conclusion from our modelling was that **there is insufficient value available to incentivise participation in LSCs today**. Even though market prices continue to recover, reflected by upward revision in retail tariffs and contract prices²³ across the market, **the prospects will decrease** with costs tending to increase (imbalance prices becoming more volatile) and important sources of value reducing (the proposed changes to embedded benefits being implemented)²⁴.

²² Under industry rule changes, namely BSC modification P305 implemented in November 2015, energy imbalance prices became more marginal (based on a smaller volume of more expensive actions), and are set to become still more marginal from November 2018.

²³ Since 1 July 2016, benchmark electricity baseload prices have increased by over a half.

²⁴ Ofgem signalled this intention subject to progression of industry rule changes in July, and provided an update of its view on 2 December. It indicated that a possible outcome was reduction of the average £34/kW credit to a level of £1-6/kW, with initial changes from April 2018 and full implementation from April 2020.

8. Other conclusions

Other conclusions from phase 2 of the Project are:

- **Recent examples of LAs entering the energy supply market are not based on the local electricity market model**, but are moves to link the relevant councils trusted brand with new types of energy procurement options in a rapidly changing and increasingly competitive retail energy market place
- **Most of these examples are based on competing in the traditional, national supply market** and is probably only available as an option to the largest and best resourced LAs prepared to acquire the relevant skills (or outsource the capability) who can deal with the significant complexities of the energy market
- The recent establishment of **LA supply businesses** Robin Hood Energy (RHE, Nottingham) and Bristol Energy Company are the best examples, though as yet customer acquisition by them has been modest (it is noted these are recent start-ups and it is unlikely that a new entrant supplier with limited resources to take out significant hedges would want to acquire many customers at present in a rising market)²⁵
- **There are white label and other partnering opportunities emerging in this area for smaller LAs, which should deliver some benefits** through, for instance, targeted offerings to rate payers and the fuel poor. A good example is the OVO Communities offering in which the established supplier partners with LAs, and there are four active collaborations in the marketplace today involving OVO²⁶
- LAs already active in the energy market are also looking to support other, typically smaller LAs and SHAs through **white label offerings**. For instance, RHE has two deals already in place with smaller LAs that we know of²⁷, and is looking actively to establish others. Given significant set up costs, there are strong incentives on LAs who have already entered or are entering the supply market to provide service through to other LAs and social SHAs
- Cornwall Energy has also done analysis separately that suggests there are options around **LAs becoming their own supplier**, procuring energy for their own estate as an initial, low-risk move into the supply market. However, in doing this these LAs are bound by public sector procurement rules that mean they have to demonstrate best value purchasing,²⁸ though non-economic and longer-term benefits can be taken into account
- With one notable exception, which is the **proposed introduction of elective half hour electricity settlement for smaller customers** planned for next year, the various changes proposed in previous local markets work carried out by Cornwall Energy and others to address the current bias under market rules has not as yet been translated into development work-streams or tangible change proposals
- Once elective half hourly settlement is implemented, the **way should be clear for the introduction of time of use tariffs**, which should incentivise demand-side response and

²⁵ Cornwall Energy estimates that the companies had signed up about 30,000 domestic customers apiece by end-September 2016.

²⁶ These involve Cheshire East, Peterborough, Southend and SouthWest.

²⁷ They are White Rose (Leeds) and LECCy (Liverpool).

²⁸ In this context it is interesting that Nottingham and Bristol councils have continued to follow established procurement routes through public tender despite the fact they have established their own supply businesses.

other flexibility mechanisms. These are likely to be of particular value for LSCs as they will provide, in theory, new mechanisms to help management of energy imbalance risk and reduce hedging costs

- Smart metering and smart grid solutions with fast acting intelligent controls, combined with half hourly settlement data and even **more granular data, may provide further market opportunities** for demand-side management for LAs and SHAs, particularly if low-cost aggregation and trading solutions can be used
- We also believe that Ofgem should instruct Elexon, the electricity market administrator, to take forward further work on options outside the existing rule book for **netting meters locally** and/or establishing **a local balancing unit** (or some other form of virtual meter), together with the associated changes that would be needed to ensure allocation of imbalance charges and network costs remain proportionate
- In the meantime, a wholesale market environment characterised by **rising and volatile commodity prices will in practice increase hedging and imbalance costs**, and the deterioration of the currency exchange rate have added additional economic barriers and increased some existing ones
- However, the current market rules require significant revision to help realise the local market opportunities but the nature of the changes necessary for the **implementation of the enabling market infrastructure remain uncertain**, as does the timetable.

We hope the follow up to the flexibility call for evidence will take on board these conclusions and provide a framework for addressing the issues surrounding local electricity markets.

9. Recommendations

We are making a number of recommendations under three headings:

(i) Regional feasibility study in East of England and further analysis

As we have already noted, the analysis we have done based on three regional case studies has been drawn to a close at least for the present, with a view to distilling lessons learned. We intend to apply these in two different ways.

First moving from the analysis stage of the Project to **scoping a detailed feasibility study in the East of England**. This would build on the current phase and consider development of a local flexibility market based around an innovation park concept. This phase will build on the current one, and:

- Examine development of a local flexibility market based around smart technology and explore the concept of energy innovation parks
- Start by scrutinising regional solar exports and understand their impact on the local system, and how this might be impacted by different commercial assumptions
- Combined with assessing interactions with merchant back-up generation, but also incorporating storage assets and demand-side response in conjunction with more dynamic, time of use pricing
- Increase the focus of work on concerns held by electricity distributors as they, potentially, move towards a role as Distribution System Operator, to better understand the trade-offs and interactions
- Consider how SHAs might be successfully integrated into the Project

- Explore different regional combinations and solutions
- Specifically address the impact of moving to more flexible settlement processes and updated charge allocation approaches.

While we have already identified some initial financial and practical support for this next phase, and participation from a range of local stakeholders including some participants from phase 2, a key step would be applying for innovation and/or energy development funding.

Second, **the tools we have developed through the project can be applied to continue to contribute to understanding local market opportunities** in a fast changing sector.

There are various examples of how the analytical framework we have developed can be utilised, including:

- The **local balancing model** provides a robust and flexible tool based on benchmarked technology costs, hedging assumptions and representative retail costs and third party charges to assess different supply approaches. It demonstrates the value available and how this can be shared between generators and LAs
- An important element of the assessment process that we have developed is our **embedded benefit ready reckoner**, which allows generation scheme specific values to be calculated differentiated by technology and location by each participant. It allows us to quickly model industry costs and calculate incremental value streams and how these are changing
- We have developed regional **green power curves**, which will be updated every quarter, that consider different revenue streams under the various market access options for generators who do not supply direct.

These and other tools will continue to form a valuable resource to the regional feasibility study specifically but more generally to LAs and local generation developers looking to understand and optimise the opportunities provided by the wider energy markets.

In this context, **we expect the wider policy and regulatory environment to change** significantly as the Government's and Ofgem's work on smarter markets and flexibility continues to close the gap between stated policy goals and the current industry baseline, and rule changes emerge out of this process. Passive distributors (DNOs) are also likely to evolve into active operators (DSOs) at the regional level, and the RIIO Price Control mechanism should see opportunities for customers and generators to benefit from providing controls and generation in areas of the distribution network where load control and generation can avoid or delay network expenditure.

The methodology we have constructed should allow development of market assessments that allow new flexible processes and technologies to be evaluated and the impact of the necessary market rule changes to be assessed as we move forward based on a full assessment of supply chain costs and revenues and the changing market background. It is at the level of local balancing and LSCs and at this granularity that flexible markets and systems will be proven, not at the national level, and Cornwall Energy with Pixie will maintain this capability.

(ii) *Working more closely with LAs in exploiting energy-related opportunities*

We refocused the Project during phase 2 to **take a closer look at what LAs are doing**, especially in the area of energy procurement (which is currently focussed on a limited number of buying groups), and the changing drivers on them. In a wider context, while there

remain real barriers to most LAs engaging in energy supply on their own, we are examining how knowledge of supply options, generation sleeving, demand-side management and energy efficiency can be summarised and transferred, along with best practice procurement where direct supply is not a realistic option.

We have also been examining LA involvement in renewable power, heat, waste disposal and transport schemes, and how synergies from these activities might support energy service company (ESCo) activities. The framework for future assessment could and probably should also include other utility services, especially given increasing LA interest in the multi-utility services (MUSCo) model in a more devolved local government structure. Our working paper on *LA energy procurement* provides an initial framework for considering work in these areas. However, there is still scope for further learning and dissemination in this area, which we intend to build on.

In addition, under this second activity stream, we envisage some specific initiatives to take into the next phase of the project based on traditional market structures and the current rule book. These include:

- Continue to monitor and build understanding of current generation and supply moves by LAs and other energy activities and their relevancies (what works, what doesn't, collaborations etc.)
- Deepen this knowledge by focusing on one particular region given the immense diversity of practice in this area. In this context, as well as our proposed feasibility study, we are specifically examining how we might support a community energy hub project in the Eastern region
- Scoping a consolidation initiative based on smaller, FiT generators²⁹ again in East Anglia and consolidating them into the e-power auction run by NFPA, who are a project participant, to determine the extent to which participating generators can improve on export rates available through posted terms or in the market
- Combined with this, pilot a purchasing initiative through an existing supplier to enable LAs to procure low-carbon electricity from a trading platform again currently operated by the NFPA. The scope could be broadened to link the LA demand with the regional FiT generation noted under the previous activity
- Explore with other project participants including suppliers and technology providers the scope for developing a regional energy services arrangement targeted on LAs and their affiliates, which could include social housing groups.

The recommendation here is that we could invite participating LAs and their affiliate bodies to some form of workshop early in 2017, to review our findings and recommendations in this area. We then propose to explore, among other things, how we can progress these activities and continue to share knowledge.

We are also discussing with Local Partnerships how these learnings can be best communicated to other LAs and their trade associations.

²⁹ Below 5MW.

(iii) *Engaging with HMG, Ofgem and other key stakeholders*

A third area for further activity concerns engaging with key stakeholders to build awareness of the benefits of and barriers facing local electricity markets, including the on-going reviews of embedded benefits and network charging.

The analytical phase of the project showed the direct and damaging impact of current regulatory moves to significantly reduce or remove the triad benefit. Linking this with other work carried out by Cornwall Energy, we are **using this evidence base to engage with BEIS and Ofgem** to demonstrate the complexity of the issues and the unintended impacts on the large and growing volume of existing distribution-connected generation and also projects in the pipeline.

The proposed changes are likely to have far-reaching consequences on innovation in the market at all levels and work against the stated objectives of a flexible, decentralised energy system. Because of this, we are intending that our report (including this executive summary) is submitted to BEIS/Ofgem as a **formal response to the flexibility call for evidence**. The call for evidence closes on 12 January. We will then continue to engage with officials as the policy development phase continues around flexibility and related issues.

We will also make sure our findings are fed into the industry strategy consultation expected from BEIS and the Emissions Reduction Plan promised by the Government, both in the Spring. We will also engage with other arms of the Government, including HM Treasury and the Department for Communities and Local Government.

We also propose to maintain the wider network of participants and stakeholders we have built around the Project to continue to advocate the merits of local electricity markets and to ensure LAs can participate in opportunities as and when they arise.

10. Further information

For enquiries on this Abbreviated Report, the underlying analysis and the supporting papers, please contact Nigel Cornwall on 01603 604406 or by email at nigel.cornwall@pixie-energy.com.