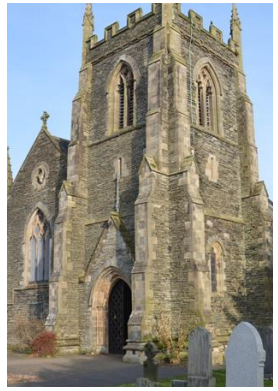
Burneside Community Energy
Powering our Communities

Phil Davies – Director at BCE and Manager at CAfS

24th Sept 2020

Burneside



What could be easier than sticking a few flat panels on a flat roof

- Power purchase agreements
- Heads of Terms and Leases
- Developing financial models and projections
- Drawing up company Rules
- Registration with the Financial Conduct Authority
- Finding and Inducting Directors
- Understanding Guarantees and Insurance (Operational and Installation)
- Writing tenders and attracting quotes
- Drawing up contracts for installation and H&S for site management
- Developing a share issue
- Establishing a community benefit fund
- Community engagement activities
- Planning considerations
- ‘End of Lease’ arrangements
- Administration of share offer and capital investment
- Arranging AGMs and Society Meetings

……..And that’s just for starters……!

Burneside Community Energy

“Opportunities to harness renewable energy for local benefit”

Projects

- 2015: 250kW PV on a roof of James Cropper PLC
- 2019: 430kW PV in 5 schemes at James Cropper’s
- 2020: c 250kW on new James Cropper building

BCE

- £580,000 raised in shares
- 103 members (mostly local)
- £27,500 in community benefit funds distributed
- Aiming for £6,000 pa community benefit
- 30kW solar PV recently installed on primary school from funds

Phase 3?

- TFP Extension / TFP north end
- 200 – 250 kW
- £150,000 - £180,000 cost: share offer needed
- No FITs but similar return and additional community benefit

ENW Powering Our Communities Fund

- **Investigating local ownership and management of a zero carbon energy supply to new homes**
- **Defining how Burneside Community could benefit from renewable energy supply to the homes**
- **Feeding into the design to help meet a zero carbon standard**

- Gill Fenna and Louise Marix-Evans, Quantum Strategy and Technology

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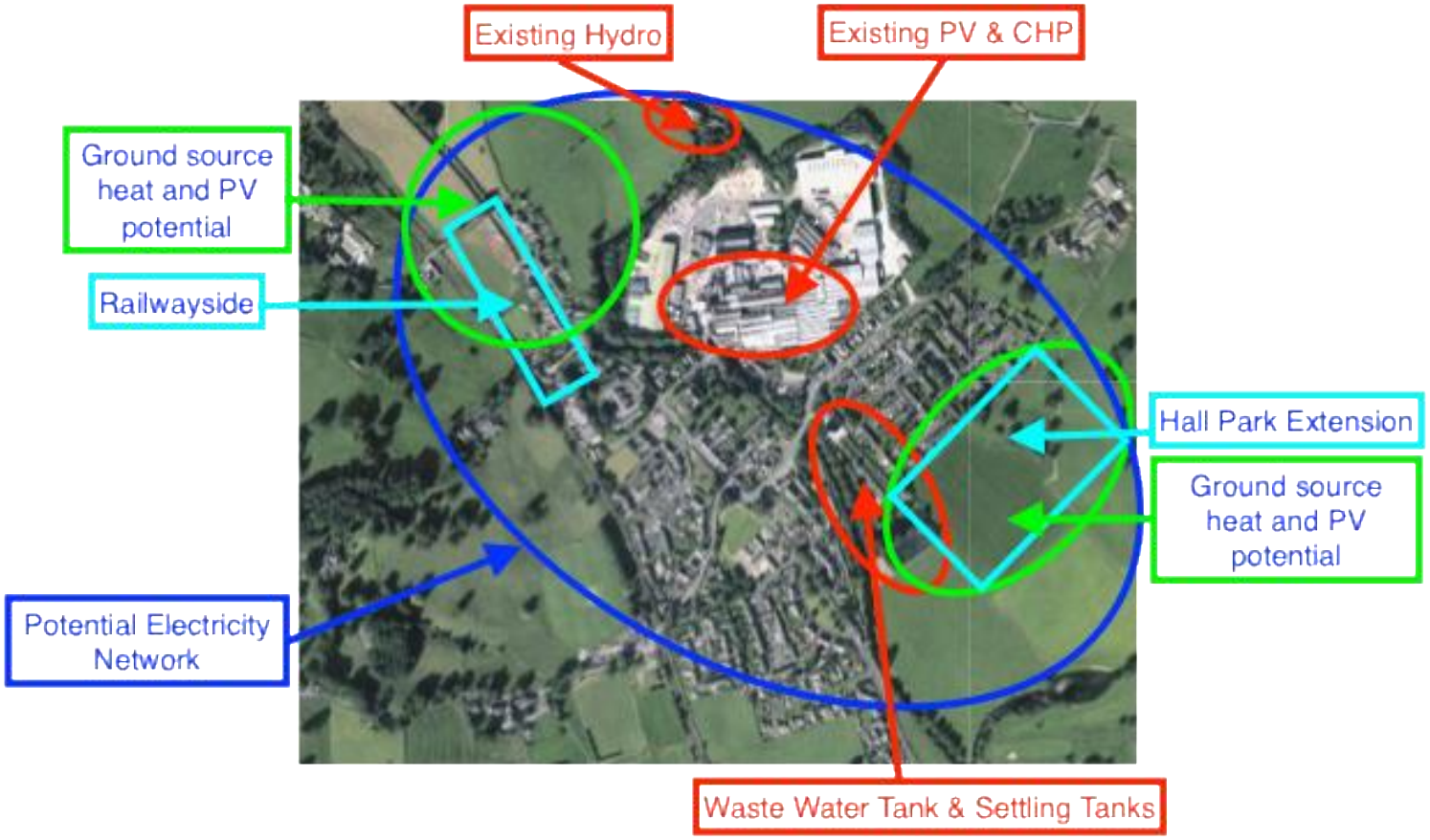
Ambitions: More than just PV…



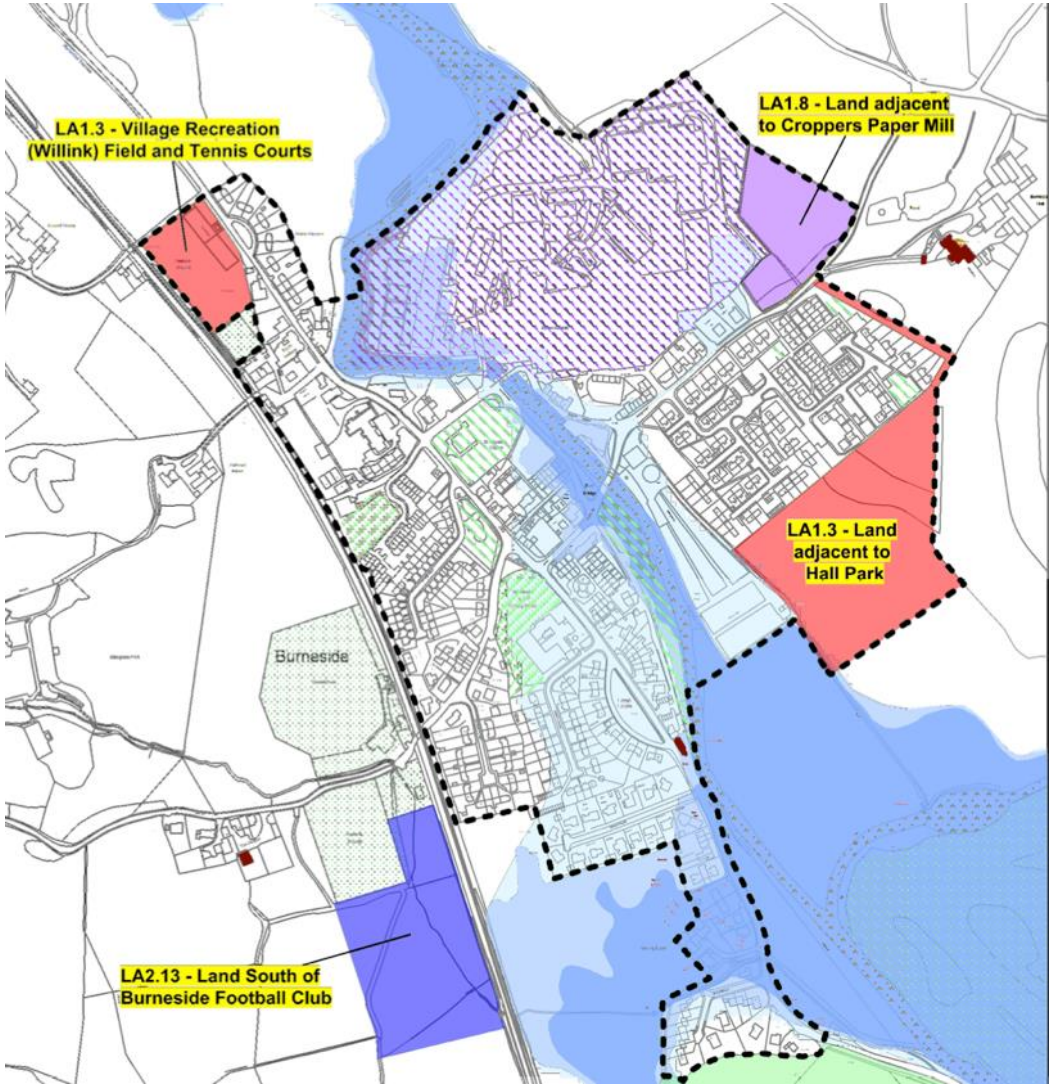
Energy in the Regeneration Project

- A **private wire** electricity network linking all the new homes, and the renewable electricity supplies, and extending across the village
- **Solar PV** on new homes and ground mounted
- **Electric vehicle** charging points
- **Heat pumps** supplying the new homes (possible district heat network)
- Electricity and heat **storage**
- Smart electricity and heat **metering**
- **Owned and operated by Community Energy**

Long Term Aims

- Low or zero carbon homes with low energy bills
- Renewable energy system owned and operated by a community energy company – for the benefit of all the community
  - Potentially a separate Energy Services Company (ESCo)
  - Householders are customers of the ESCo
  - Excellent customer service
- Residents engaged in the process of developing this new system
- Householders and residents increasingly aware of carbon impacts of homes, travel and other activities
- Exemplar development to demonstrate possibilities to other housing developers

Local Plan Allocations



“Homes that are intelligent, connected and enable a zero-carbon sustainable lifestyle including community ownership of energy supply systems and a fabric-first approach to energy efficiency.”

Issues

Technical Challenges

- Maximising use/value of local generation – technology mix, controls, storage, demand management?
- Installing & managing complex networks: heat & electricity
- External connections: grid constraints, James Cropper CHP?

Organisational Challenges

- Responsibilities of BCE as a supplier – maintenance, management, billing, customer service, reporting
- Buy-in from home owners and community
- Organisation structure – customer co-operative?

Current and next steps

- Involved in regeneration design team
- ENW Powering Our Communities Grant and now Next Generation Funding to
- Learning lessons from other projects
- Define the technologies, energy balancing, controls, contracts
- Develop the business case
- Raising the finance
- Developing the organisational capacity
- Install in partnership with developer

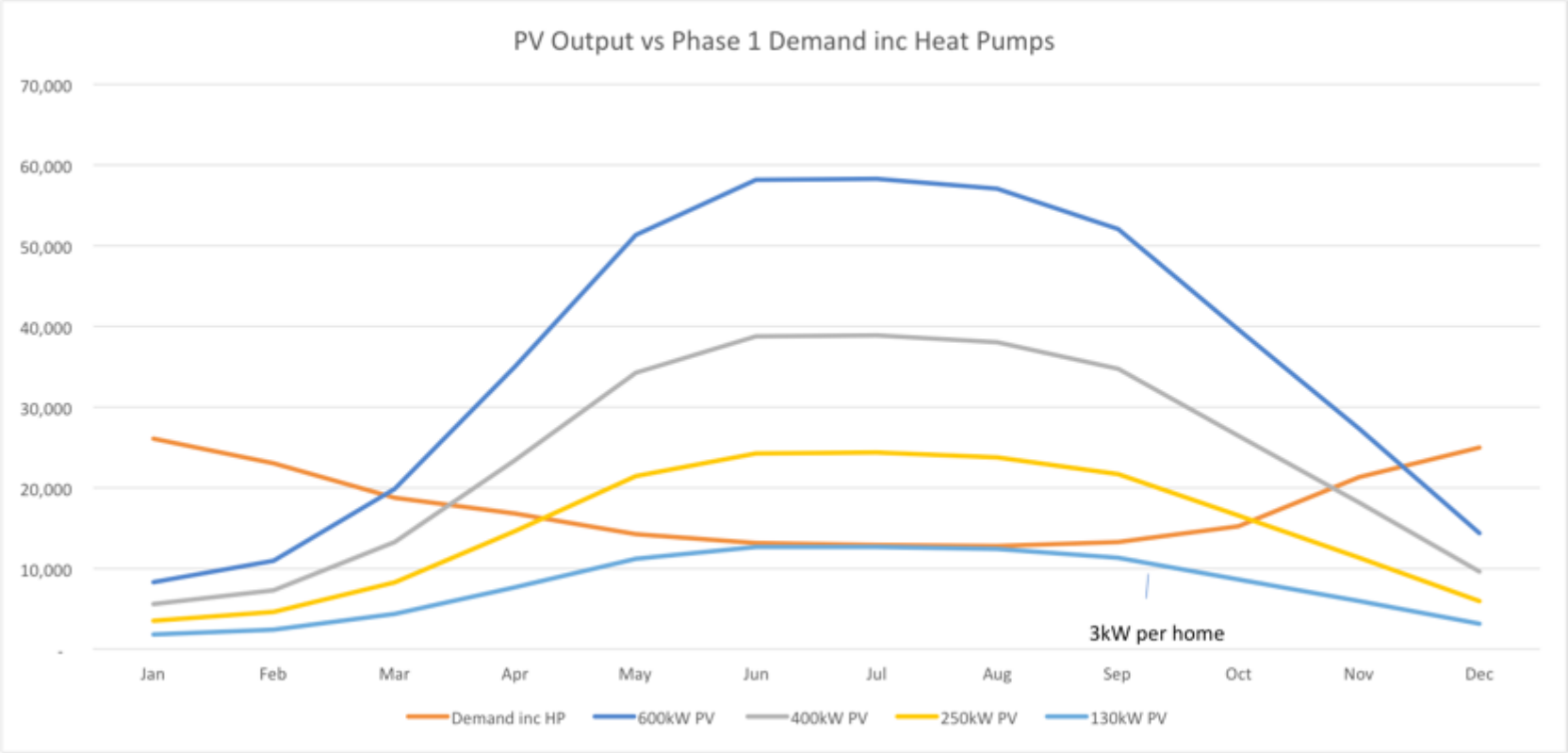
Legal constraints on selling energy

- Micro-grid required for direct electricity sales to domestic customers
  - Greater income from sales
- Alternative: buying scheme for householders
  - Complex and limited value
- Net zero supply via National Grid
  - Unlikely to justify investment
- Highly regulated sector: requirement to allow customers to change supplier
- Heat less regulated but easier to get it wrong: Code of Practice for heat networks
- Market implications?

Electricity Demand

Scenario	Average New House	AECB Silver + std power	Passivhaus	Passivhaus + low power	Passivhaus + low power +high EV
Number of homes	70	70	70	70	70
Assumed Ave Demand per house	kWh	kWh	kWh	kWh	kWh
Heat	6500	4500	2000	2000	2000
Electric Power exc heat and EVs	3200	3000	2000	1500	1500
EV charging	750	750	750	750	1500
PV capacity needed kW	575	500	335	285	360
PV potential on roofs @ 3kW per roof	210	210	210	210	210
Ground mounted PV needed kW	365	290	125	75	150

PV Supply/Demand Profile



Energy Supply Options

- Transport
  - Electricity for EV charging
  - Local or centralized storage? Vehicle to grid?
- Heat
  - Space heating: heat pumps (individual or central), mechanical ventilation & heat recovery, direct electric
  - Water heating: heat pumps, solar thermal, direct electric
  - Distribution: individual systems, shared ground loop, district heating
  - Storage: DHW tanks, inter-seasonal?
- Electricity
  - PV only realistic option – daily/annual supply/demand profile problems
  - Battery storage – daily variations
  - Import from Croppers – not zero carbon

Zero Carbon Energy Supply

- Net zero supply
  - Local renewable energy generation kWh = Local demand kWh
  - Peak generation exported, peak demand imported
- Islanded supply
  - All demand is supplied from local generation
  - Ability to be completely separate from grid
  - Reliant on storage and demand management

Zero Carbon Homes

- Calculating carbon: impact of grid decarbonisation
- Building efficiency standards:
  - Building Regulations – regulated & unregulated emissions
  - Passivhaus
  - AECB
- Fabric efficiency vs zero carbon supply
- Design vs in-use energy demand
- Embedded carbon in construction

How Community Energy Works

Design Decisions impacting BCE

- Housing numbers
- Fabric efficiency /solar gain
- Housing size/type
- Layout
- Orientation/ roof design/shading
- Location
- Transport
- Tenure

- **Construction decisions**: who owns risk if not built to specification?

Conclusions

1. **ENW Powering our Communities grant has been invaluable (and employing Quantum, too). Use the grant wisely and perhaps include a 'capacity building' element too (future funding / key partners / organisational strength etc.)**

2. **Do no underestimate the administration and governance requirement for running a community energy company.**

3. **You will get exhausted – stay focussed on your ambition and get to the end!**

4. **Get as many clear, organised minds and passionate people involved in the management as you can and ask the 'dumb' questions. (When the only person who 'knows' leaves, you mustn't end up looking blankly at one another!)**

5. **Best of luck. It's a brighter future you are creating!**

Burneside Community Energy