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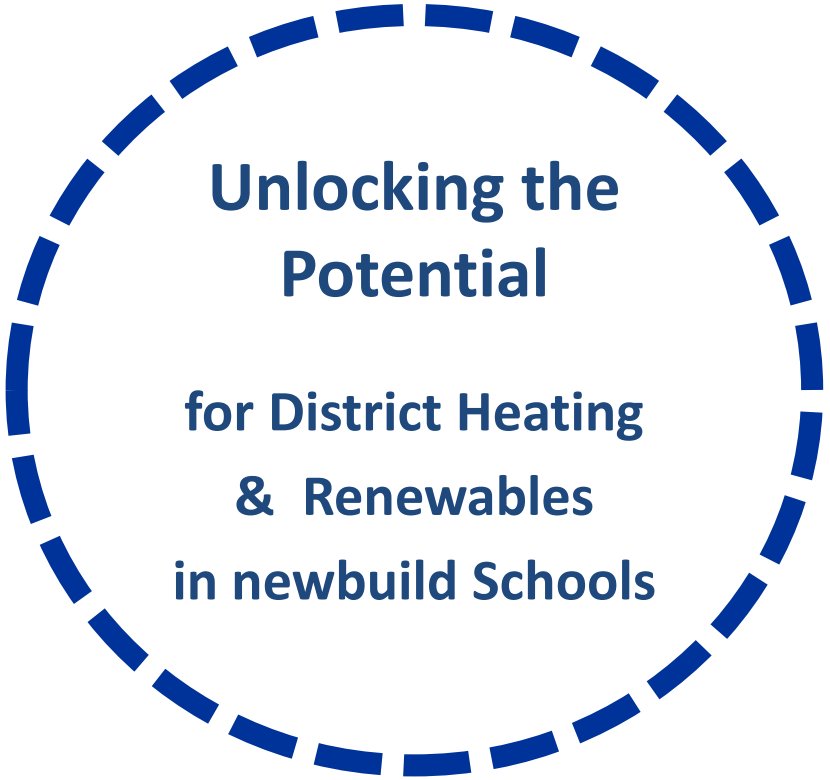

Jamie Goth
Scottish Futures Trust
Association for Public Service Excellence
24th April 2018

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1. Definitions
2. Drivers
3. Aligning drivers - project's & Council's drivers
4. Change now
5. Change in the long term

Definitions: What are renewables in Schools?

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Electricity

- Photovoltaic (PV)
- Wind
- Combined heat & power (biomass)
- Micro-Hydro

Heat

- Biomass
- Heat Pumps (air, ground or water)
- Solar thermal
- Wind to heat…

Definitions: What is district heating?

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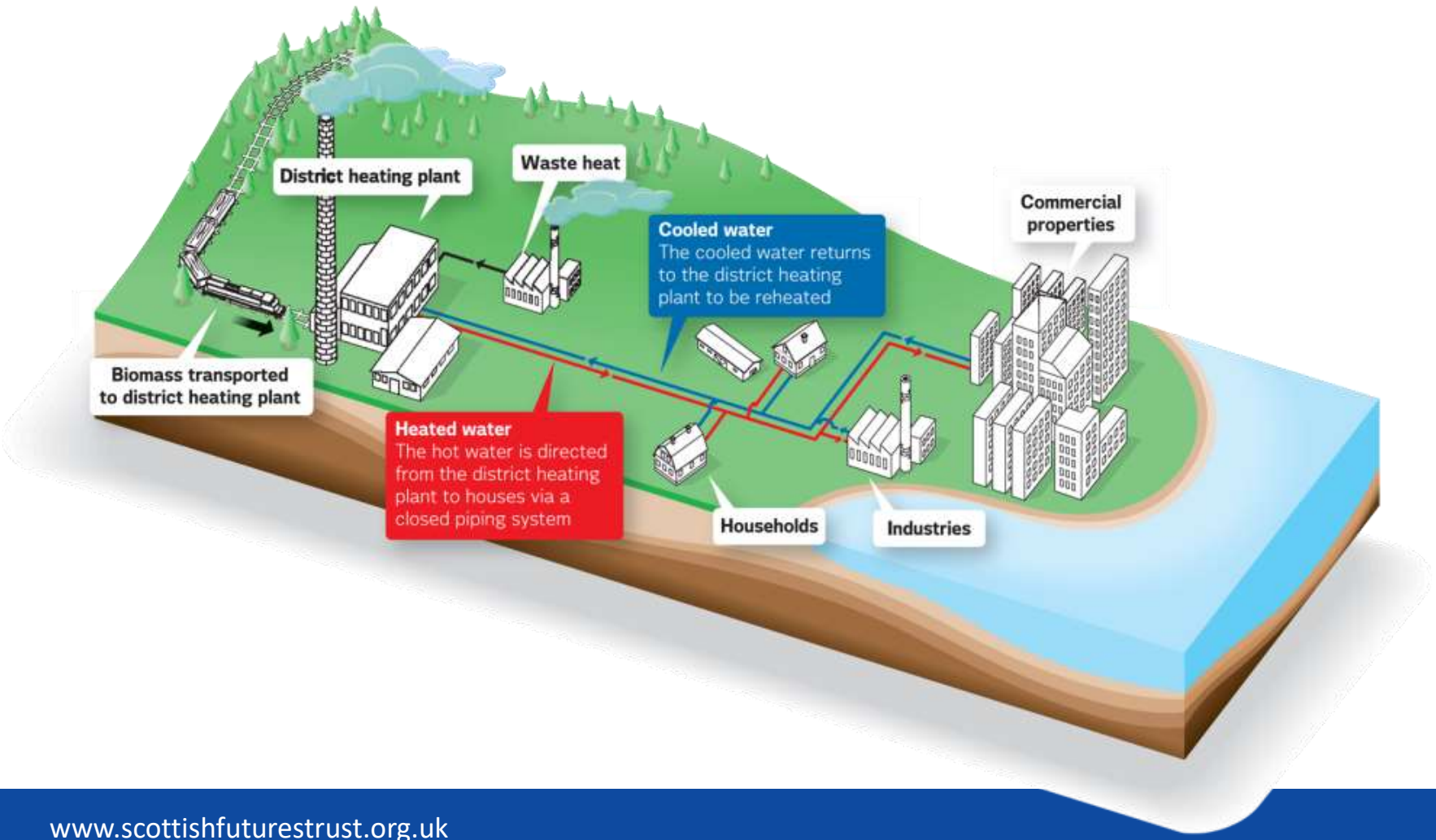

Definitions: What is district heating?

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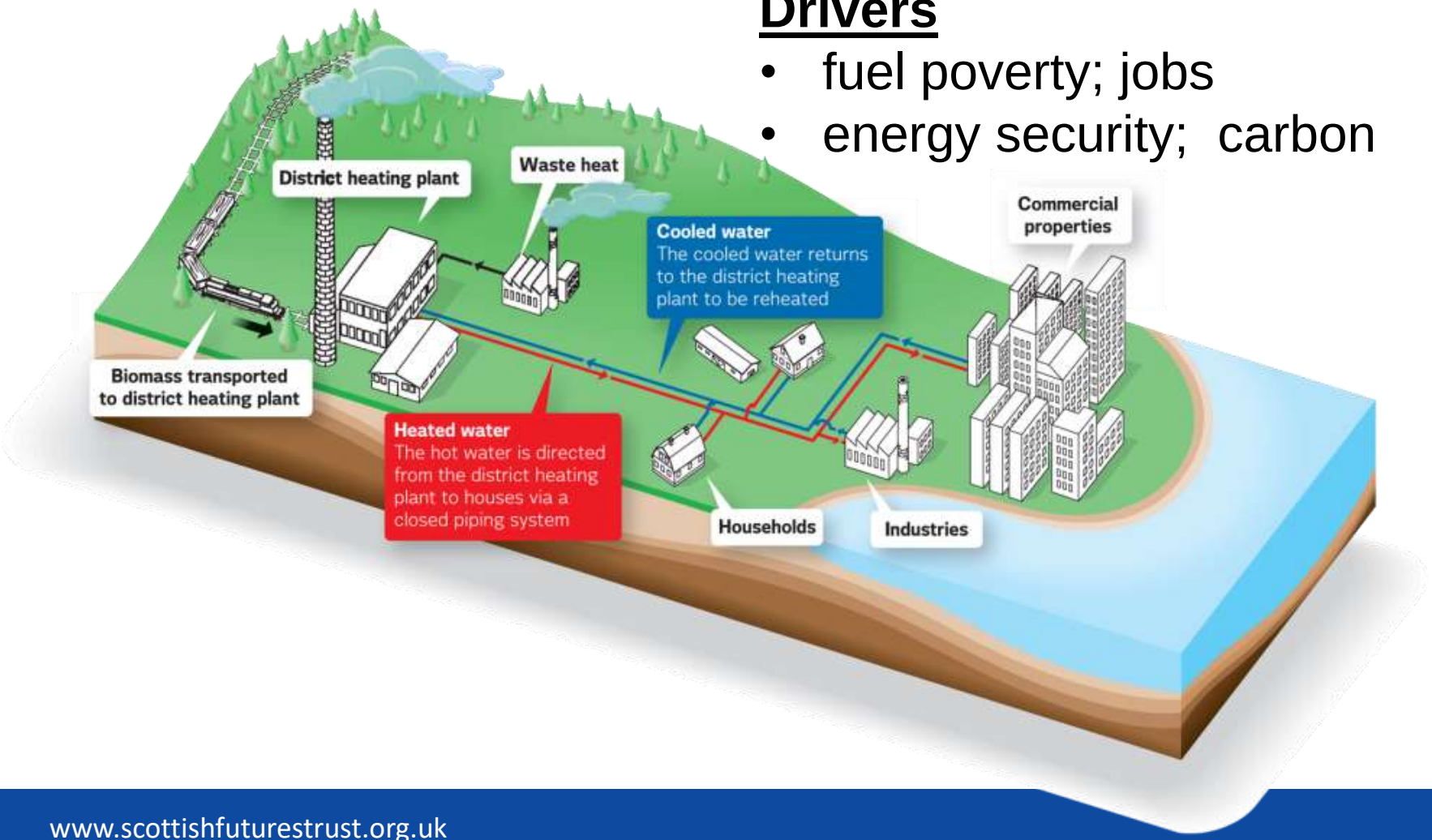

Drivers

- fuel poverty; jobs
- energy security; carbon

Targets

- Largely de-carbonised heat sector by 2050

2020

- 40,000 DH homes
- 1.5TWh of DH heat
- 11% renewables heat

2050

- Near zero carbon heat

Drivers

for District Heating & Renewables in Schools

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Policy Drivers

- Scottish Energy Strategy
- Scottish Energy Efficiency Programme
- Heat and Energy Efficiency Strategies and Regulation of District Heating

Organisational Drivers

- Reduce Costs
- Lowers Exposure to Price Increases
- Reduces Emissions
- Upgrade Poor Infrastructure

Drivers - Public Sector Energy Use

Source: Carbon Management Plans, Carbon Trust, 2013

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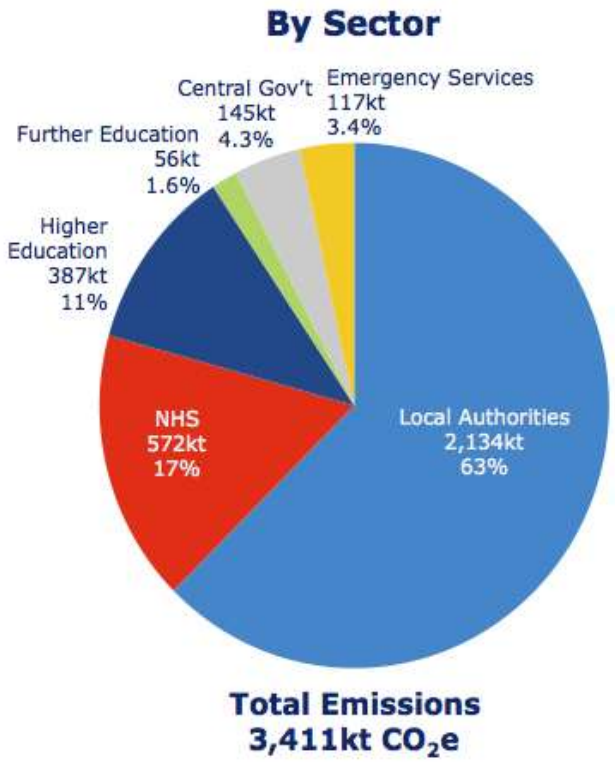

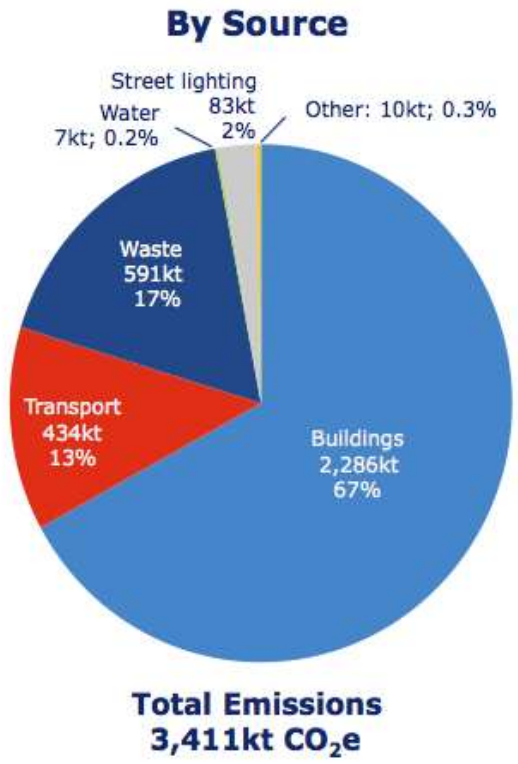

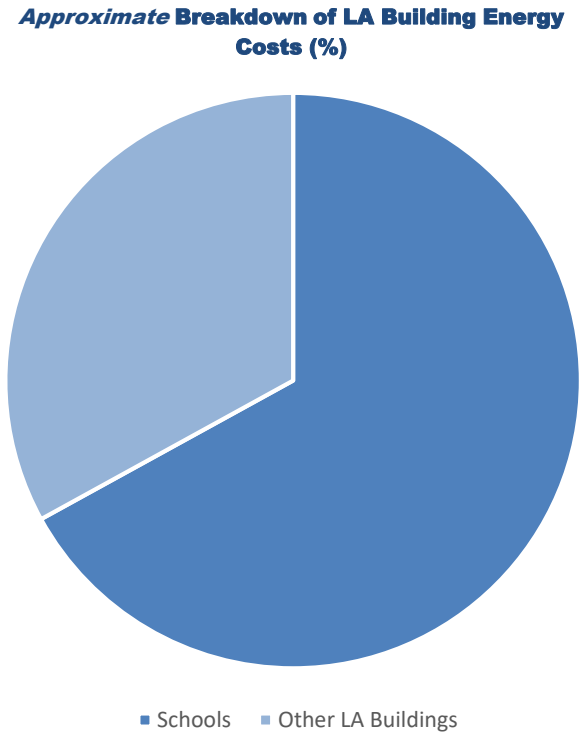

Schools in Scotland:-

- Biggest single source of public sector emissions
- ~25% of all public sector emissions
- ~40%+ of public sector building energy emissions

Aligning Drivers – Project's & Council's Drivers

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Strategic

- Planning
- Regulatory
- Residents' Benefits
- Fuel Poverty
- Carbon Emissions
- Regeneration

Financial

- Available funds
- Access to finance

Economic

- Revenue budgets & incentives
- Investible projects: tech & economic

Commercial

- Size of UK DH market
- Procurement routes
- Contracts, e.g. heat supply

Management

- Security of fuel supply (biomass)
- Grid connections
- Internal resource; collaboration

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Aligning Drivers – Project's & Council's Drivers

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Strategic

Planning & Carbon Emissions

-- Plan District Heating preference zones

– Set project's *operational* energy and carbon targets to meet Council's strategy

Financial

Available funds

– Does budget cover project's Council-aligned objectives?

Economic

Investible projects: tech & economic

– Apply life cycle costing to compare options, following Council's criteria

Commercial

Contracts, e.g. heat supply

– Ensure project team has expertise to consider DH & renewables contracts, including biomass fuel supplies

Management

Internal resource; collaboration

– Ensure Council and external teams have access to expertise, budget and programme time to focus on DH, RES

Actions Now for District Heating & Renewables

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- Leadership
  - Assign time, budget & personnel to:
    - Set objectives in brief
    - Align project objectives with planning zones for DH & Renewables
    - Seek early stage opportunities
    - Commissioning, snagging, training
  - Verify objectives throughout process
- Analyses
  - Apply operational, not assigned energy use
    - Compliance is minimum standard
    - Use modelling to adjust design
- Tools & Guidance
  - Scotland's Heat Map
  - Whole life Cost Appraisal
  - Environmental Sustainability Toolkit
- Perception & understanding
  - Review past projects
  - Summarise & Report successes & mistakes
    - Apply to new projects
- Skillsets
  - Consult operational staff, stakeholders
  - Train inhouse project personnel
  - Select experienced design teams
    - Including contract & procurement expertise

- Leadership
- Analyses

- Tools & Guidance
- Perception & understanding
- Skillsets

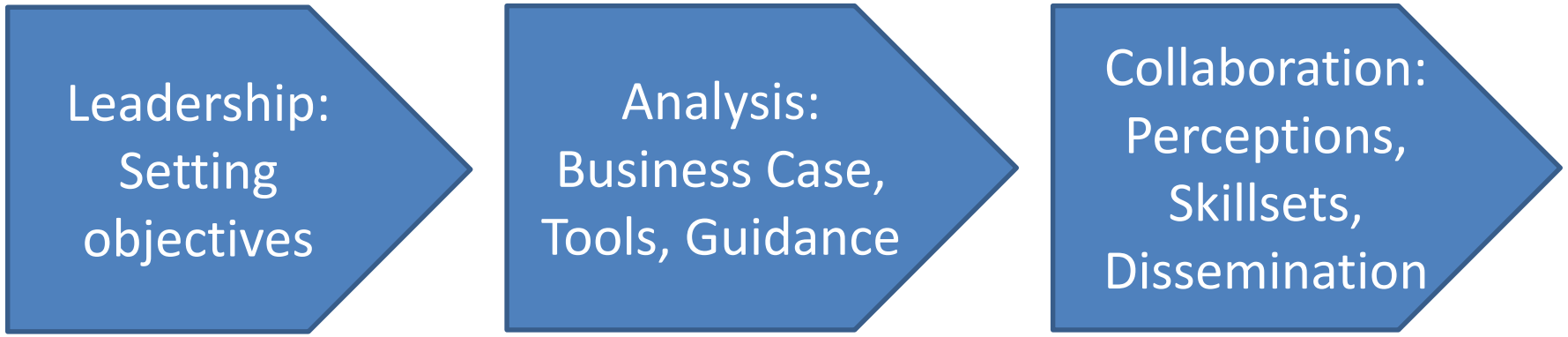
Leadership: Setting objectives

- Leadership
- Analyses

- Tools & Guidance
- Perception & understanding
- Skillsets

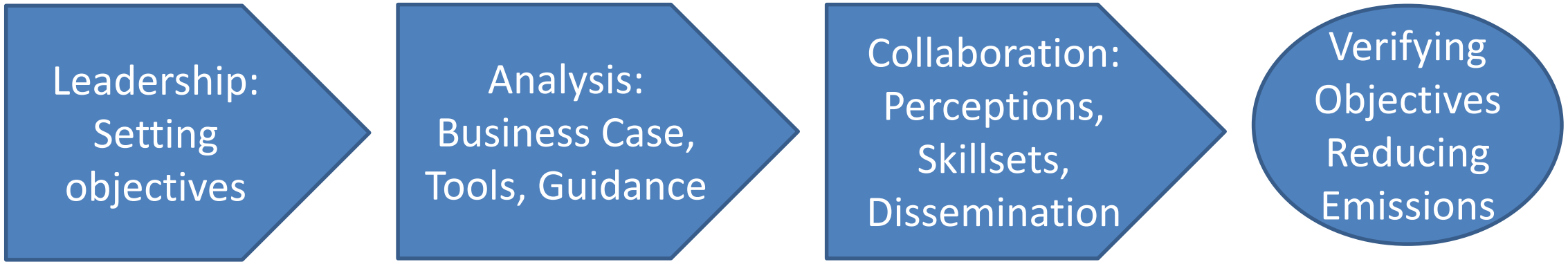
- Leadership
- Analyses

- Tools & Guidance
- Perception & understanding
- Skillsets



- Leadership
- Analyses

- Tools & Guidance
- Perception & understanding
- Skillsets



Long Term Actions for District Heating & Renewables

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- Regulatory & planning framework further supporting DH & renewables
  - Including structure of revenue costs and savings in electricity market
- Electricity and Gas Grid decarbonisation
  - further supporting heat pumps for low temperature heating systems
- Gas-fired CHP becoming *uncompetitive* (re carbon)
- Greater demand side management:
  - energy storage, smart cities, smart buildings, internet of things
- Greater application of passive technologies & techniques
- Estimated £10bn of infrastructure improvements needed → need strong business cases
- Decreasing role of subsidy
- Near zero emissions buildings

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Conclusions?

- Schools are biggest LA energy users
- Great opportunities for district heating & renewables – but under-implemented
- SEEP is likely to set tighter targets
- Direction of travel is more district heating and renewables in schools
- Leadership → lessons learnt; setting objectives & verifying them

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