

Retrofit a whole systems approach

Designing effective area-wide retrofit; scaling-up through better data, planning and delivery

Hugh Aston Building, De Montfort University, Leicester
24th September 2013

Dr Michael Crilly Studio UrbanArea LLP, Newcastle
Technology Future Institutes, Teesside University

StudioUrbanArea^{LLP}



Whole systems?

Town Planner's perspective / integrated & holistic (complex) / unforeseen consequences
Framework for integration

Hannover demonstration projects

Kronsberg (new build & hybrid) standard to existing properties
6th Framework Programme / mainstreaming (scaling up) retrofitting

Newcastle demonstration projects

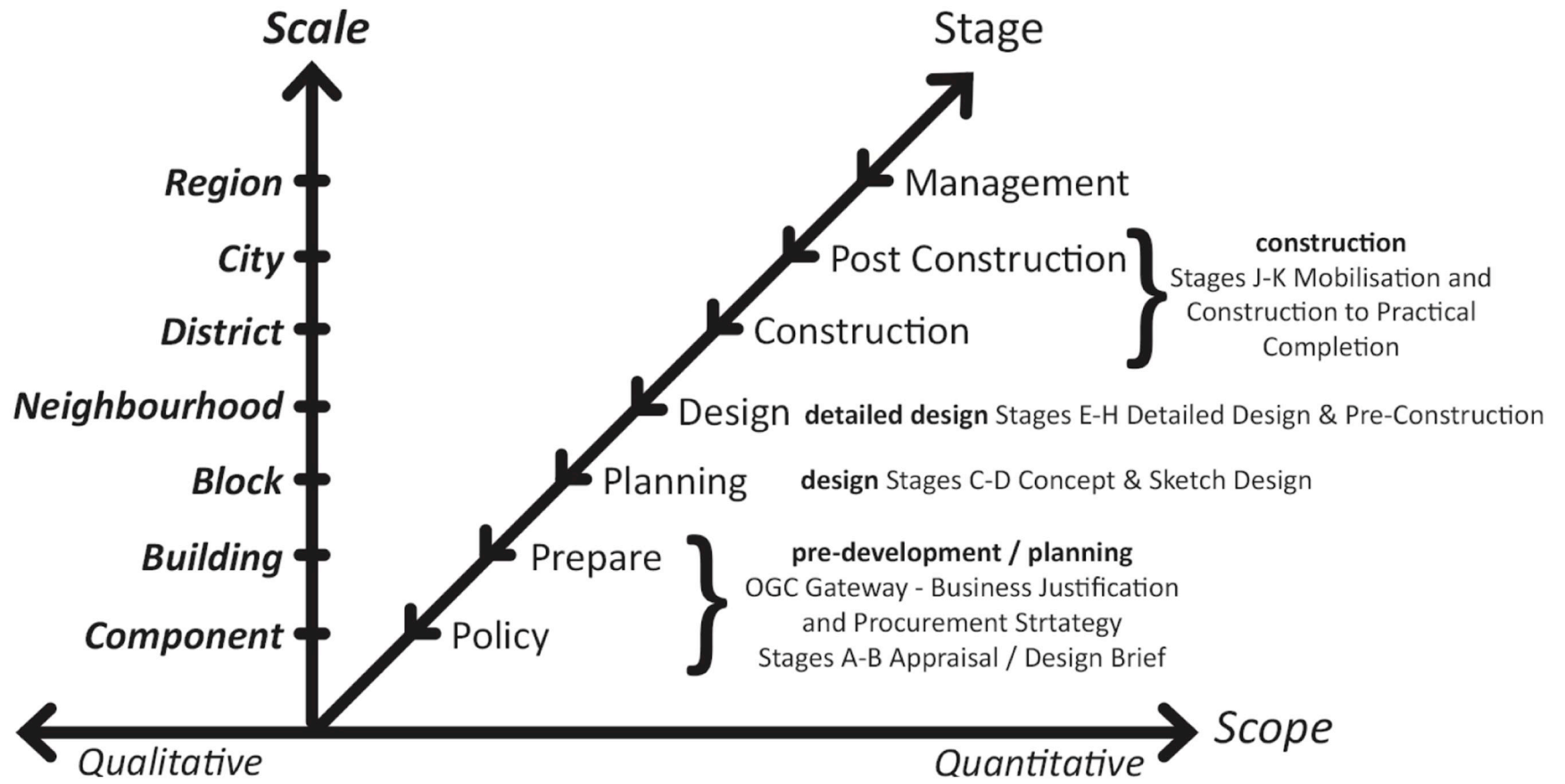
Retrofit for the Future (Technology Strategy Board)
Housing Market renewal (Bridging NewcastleGateshead Pathfinder) programme

Heuristic outcomes

What can we learn from having a go

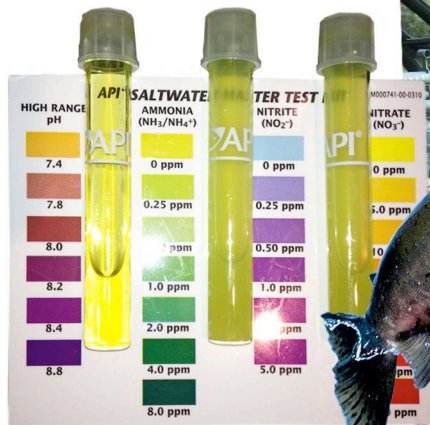
Whole systems?

Framework for integration / scale / stage / scope



Whole systems?

Integrated & holistic (complex) / unforeseen consequences ...



Intention

KPIs

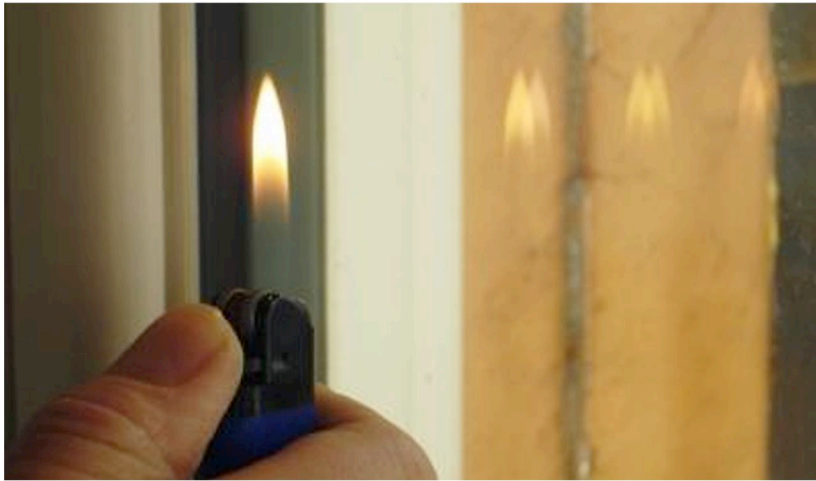
KPIs

KPIs

Outcome

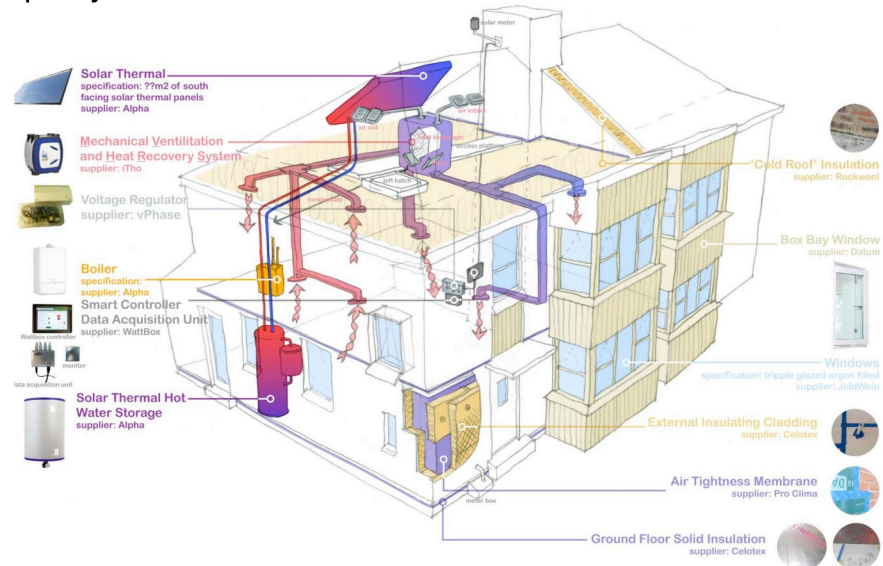
Große Barlinge Passiv Haus, Hannover

Multiple occupancy residential retrofit / passivhaus standards / communal energy systems / occupancy involvement & qualitative feedback (triple glazing reflections) ...



Retrofit for the Future, Greenford Road Newcastle upon Tyne

Demonstration retrofit to passivhaus principles / 80% reduction in carbon emissions & energy demand / whole house strategy / fabric first / target thermal bridging / quality control ...

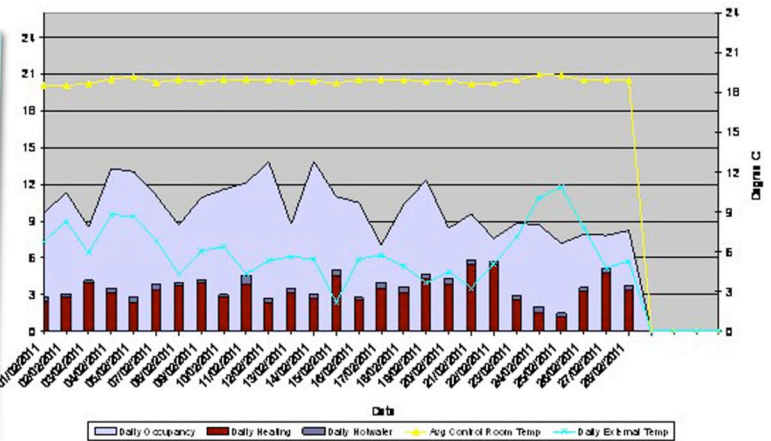


Occupancy strategy / resident involvement / scoping & training / communication / monitoring ...



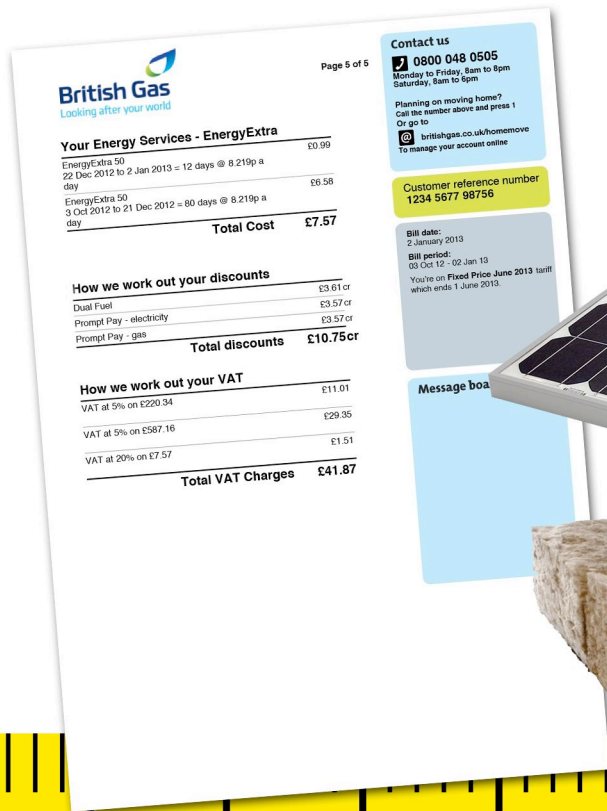
... with exposed cross-section of doorway ...

44 Greenford Road, Walker -- February 2011 Boiler Firing Report



Green Deal?

Integrated & holistic (complex) / unforeseen consequences ...



Intention

KPIs

KPIs

KPIs

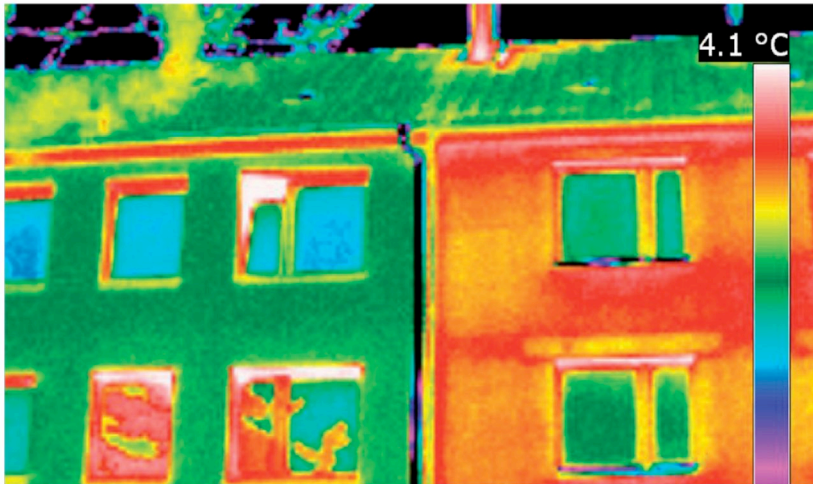
Outcome

Gundlach, Hannover

Demonstration for large scale social housing & private landlord property (over 29 multiple occupancy properties) / biomass heat network / impacts include disturbance (occupied during refurbishment) & changing occupant behaviour ...



Transfer of new build (Kronsberg) standard to existing post-war stock / development of 5-stage quality control process including training & validation (contractors & component supply chain) / local certification (proKlima partnership SPV with municipality / grant conditions / monitoring (metering actual energy consumption & CO² emissions) ...



Housing Market Renewal?

Simplistic metrics (new build / refurbishment / demolition) ...



Intention

KPIs

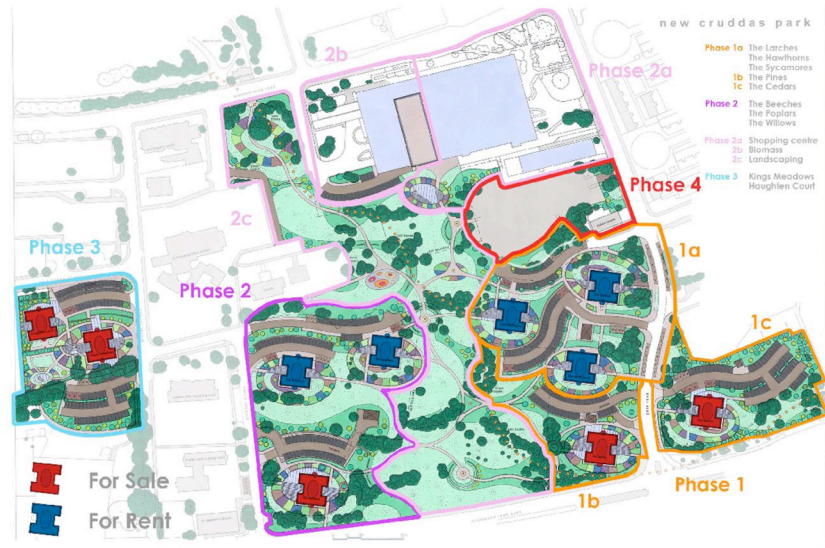
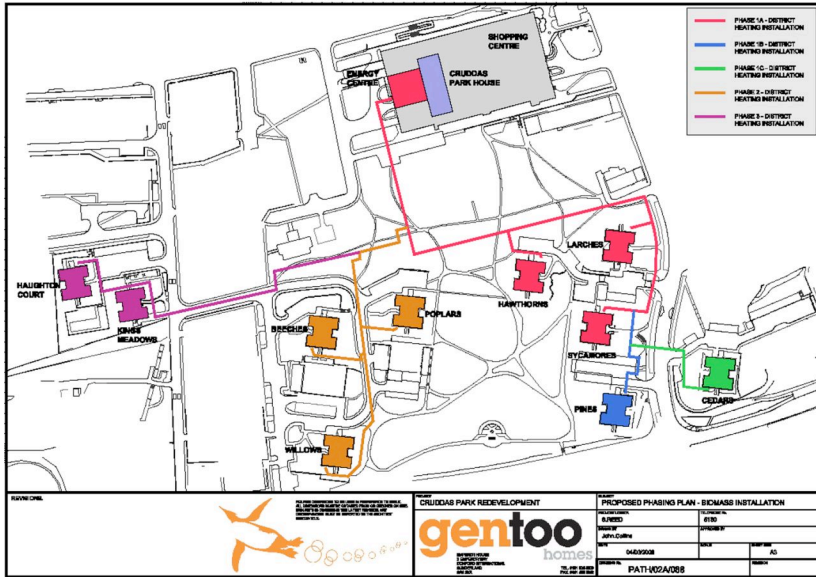
KPIs

KPIs

Outcome

Riverside Dean, Newcastle

HMR Pathfinder funded high rise refurbishment / multiple occupancy / area masterplan & heat system ...

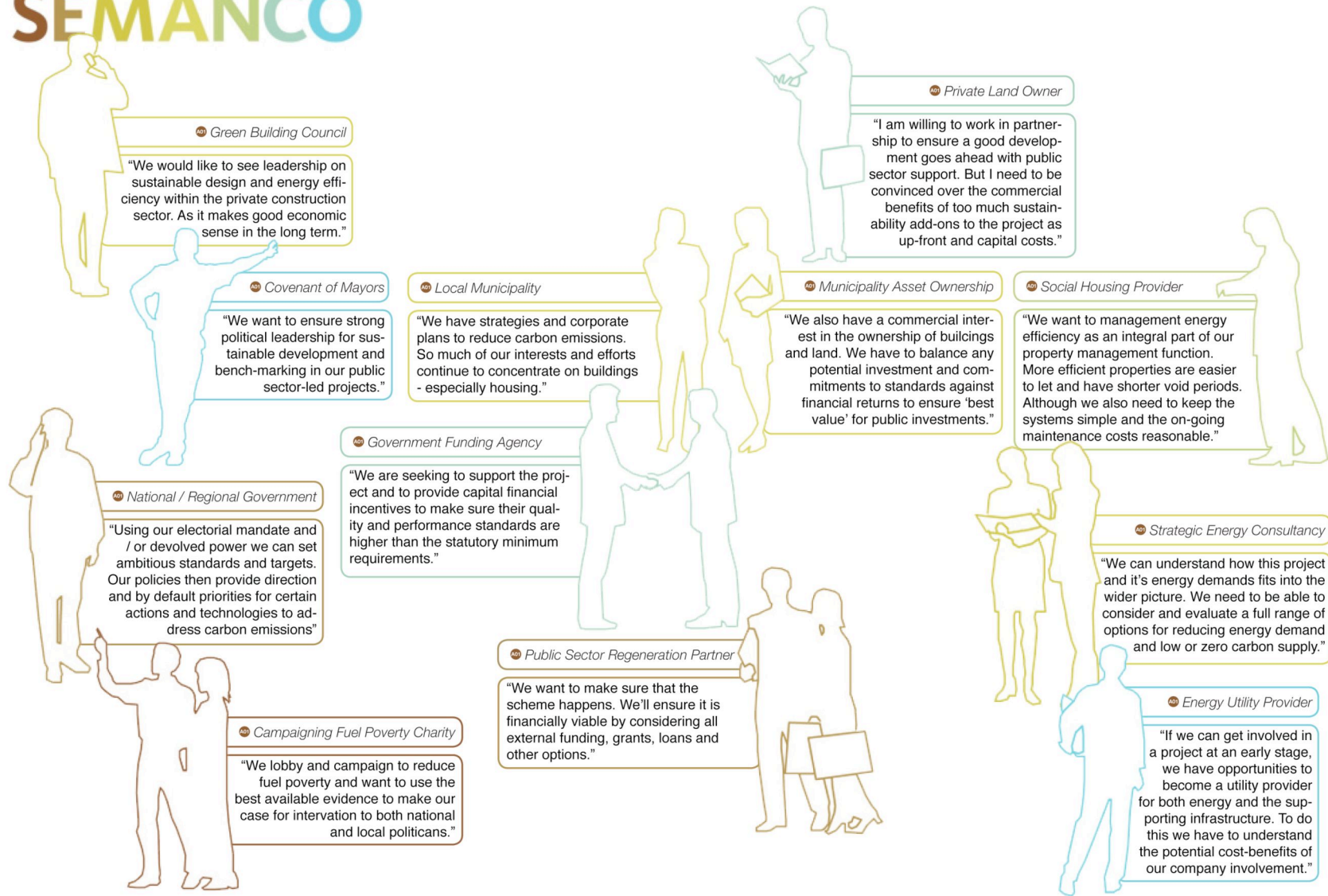


Procurement model of city municipal heat network / conflict between demand management & energy efficiency / viability issues for later phases / difficulty in achieving mixed tenure (stage one work in progress 2010) ...



Semantic stakeholder analysis / organisational complexity (project initiation & business justification stage) ...

SEMANCO



Systems?

What were the (unforeseen) consequences ...

Hannover demonstration projects

stage

Organisational / procedural framework for each stage of the design and development process
Coordinated initiatives / strong & consistent political leadership

scale

Knowledge transfer (individual components & whole house scale) from new build to refurbishment
Professional skills & competencies / increasing capacity

scope

Financial benefit (higher rents & shorter void periods)
Social benefit (occupant satisfaction / fuel poverty)
Environmental benefit (reduction in CO² emissions)

Newcastle demonstration projects

stage

Separation of project initiation (business planning & viability) from technical stages (design & construction)
Poor consideration of occupant (engagement / preferences / adaptation of behaviour)

scale

Emphasis on 'proof of concept' projects / benefits of corporate involvement (
Limited by ownership & tenure

scope

Conflicting KPI outcomes

Thank you

Dr Michael Crilly Studio UrbanArea LLP, Newcastle
Technology Future Institutes, Teesside University

Contact michael@urbanarea.co.uk

StudioUrbanArea^{LLP}

