

Regulatory Policy Developments

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Energy Policy - Is There a Plan?

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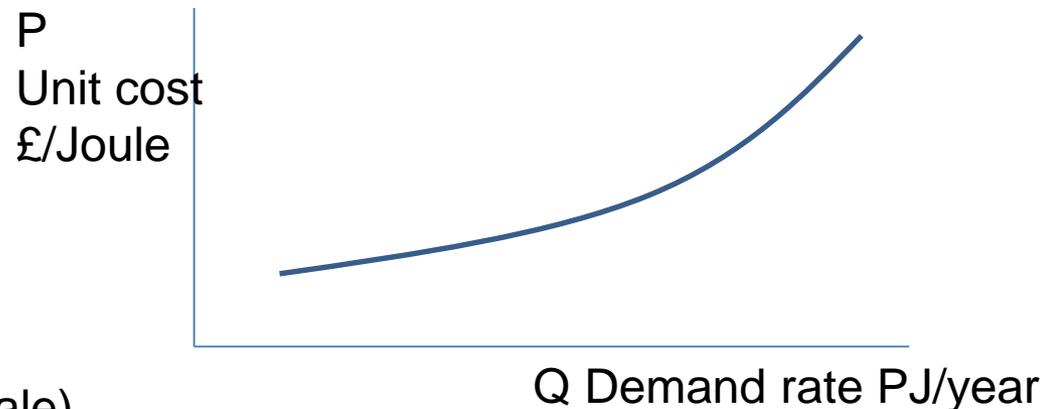
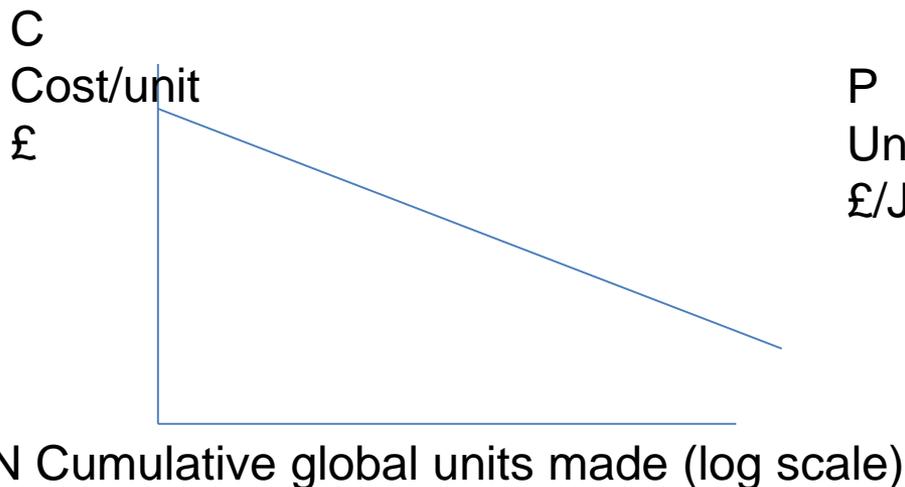


Selected Key *Global* Energy Themes*

- Faster mobility revolution
- Alternative pathways to low carbon world
- Risk to gas demand
- Post peak decline in oil demand ?
- Will power dominate energy demand growth

*BP Energy Outlook 2017

The global trend affects the cost environment in the UK (oil, carbon, natural gas, hydrogen, interconnector power import, batteries, photovoltaic, electric cars, carbon capture and storage, renewable power)



The Familiar Essentials

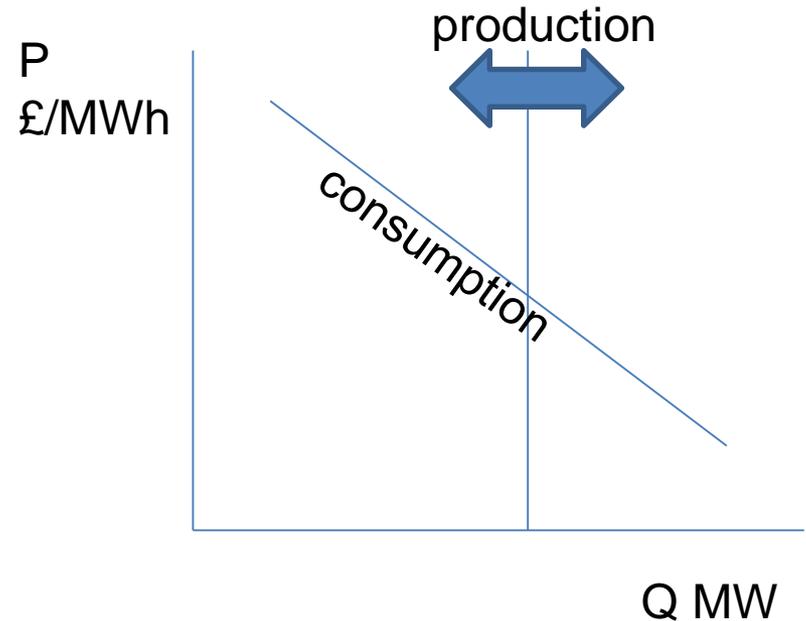
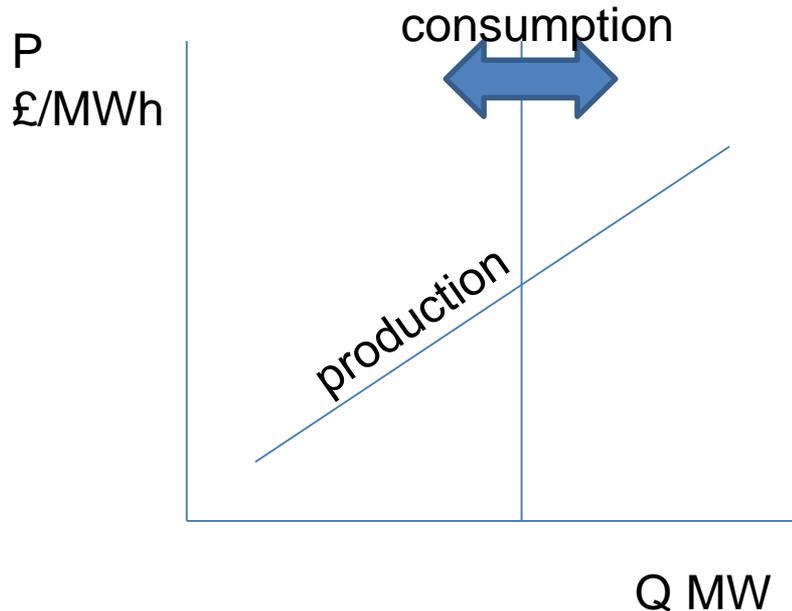
Clean (Low carbon, air quality)
Secure (Adequacy, Resilience)
Affordable (Fuel Poverty, Industry competition)

The nature of the security requirement is changing radically

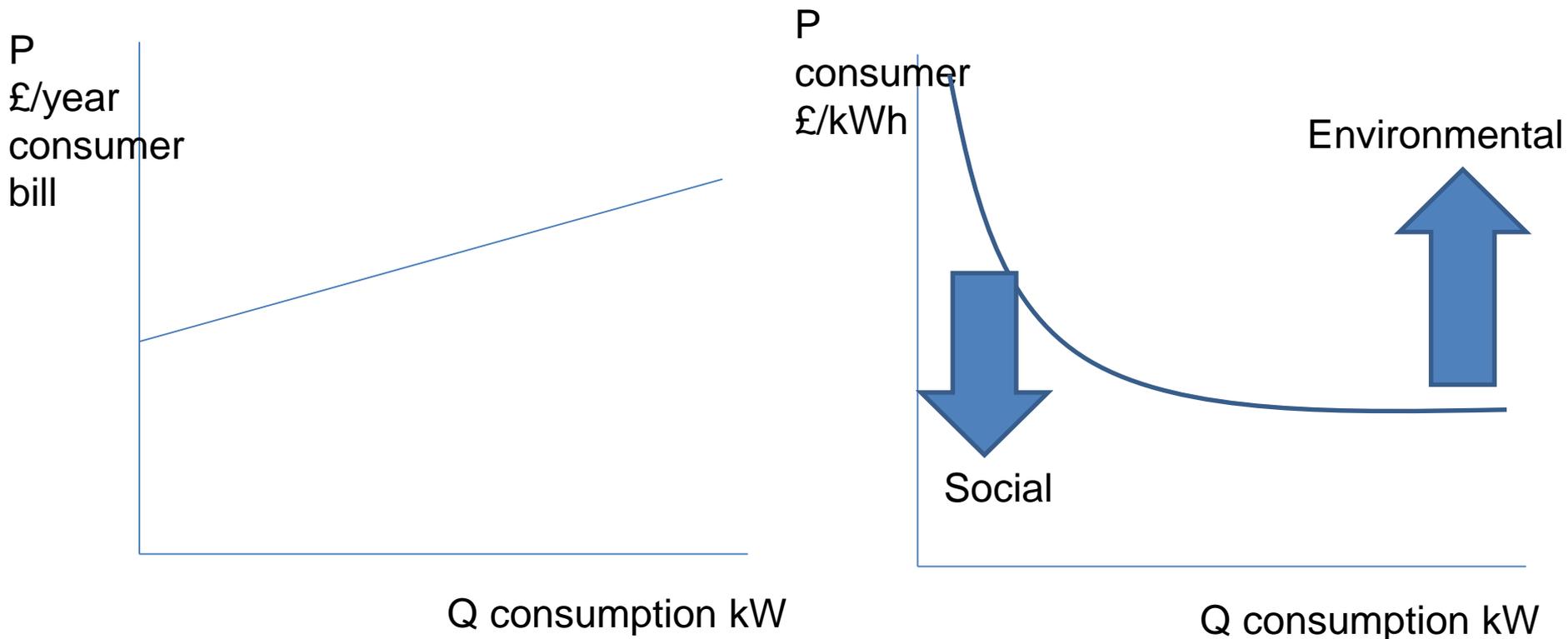
Central flexible generation
Inelastic variable demand



Decentral inflexible variable generation
Elastic net demand



GB power and gas policy - Current cost-price environment needs



Reduce fixed infrastructure costs

Continue relaxation of regulatory policy of socialising costs and suppressing price signals

Provide financial support for Low Income Low Consuming

Provide efficiency measures for Low Income High Consuming

Three elements of regulatory policy

- Infrastructure
- Fiscal – welfare
- Engagement

Emerging from...

P
Willingness to pay
£/kWh
(Log scale)

£100,000
£10,000
£1000
£100
£1
£0.1
£0.01

Perfect Grid
Synchronous
Electricity
Light
ICT
(communication,
computing)

Motion
(machines,
motors,
transport)

Oil

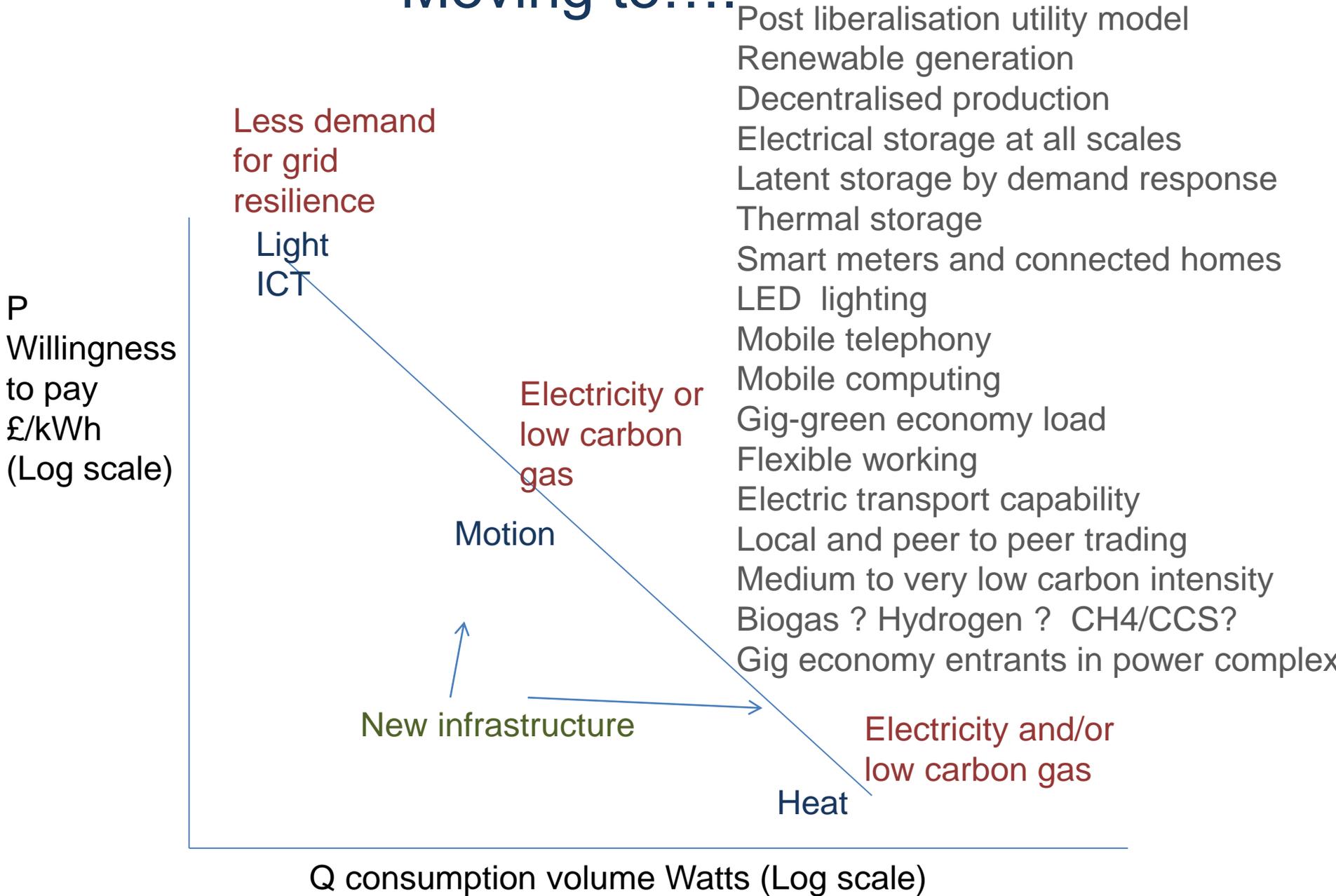
Heat
(space,
water)

Gas

Post nationalised utilities
Centralised production infrastructure
Generation by steam
Minimal round turn storage
Minimal latent storage by demand timing
Minimal thermal storage
Incandescent lighting
Land line telephony
Static computing
Industrial load
Regular commuting
High then medium carbon intensity

Q consumption volume Watts (Log scale)

Moving to.....



The policy decision in global context

- Faster mobility revolution
- Alternative pathways to low carbon world
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The “once per generation” no regret energy policy decision is what infrastructure is needed for winter space heat and is that consistent with a low carbon transport infrastructure

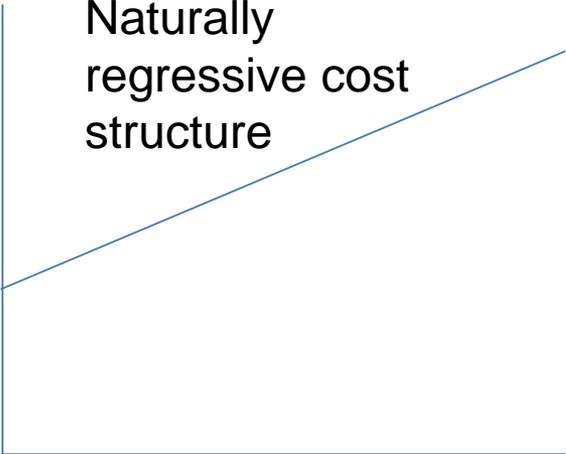
The need to build infrastructure and reduce fixed costs for stranded infrastructure and the need to test solutions means that we need to try out some large scale multi vector (power, heat, transport and possibly water) solutions at scale and learn quickly

Power infrastructure unlikely to be stranded but there is a risk for gas

Fiscal-welfare solutions

Bill
£/year

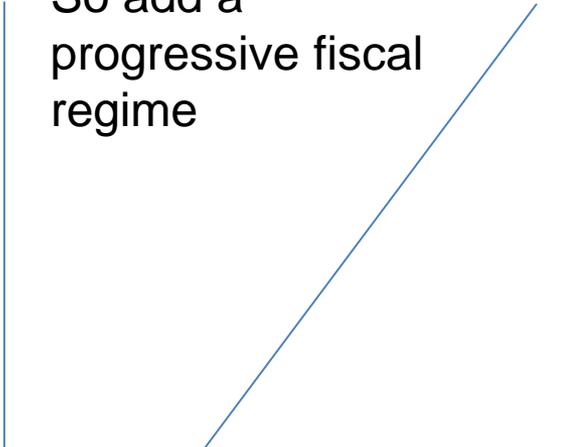
Naturally
regressive cost
structure



Consumption kWh/year

Tax
£/year

So add a
progressive fiscal
regime

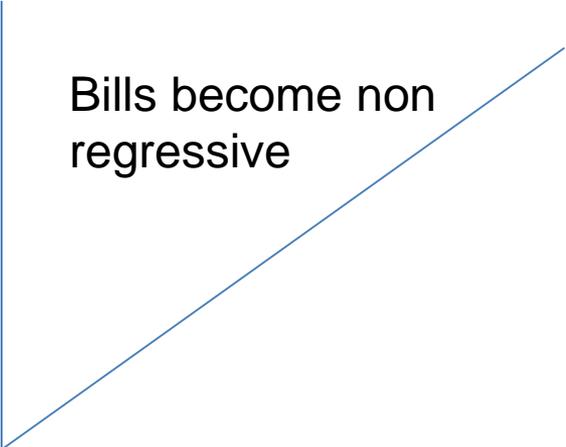


Consumption kWh/year



Bill
£/year

Bills become non
regressive



Consumption kWh/year

The money hypothecates
to bill discounts and
efficiency measures

Regulatory Policy for Consumer/Prosumer Engagement

- Markets deliver “first best” economic surplus, which can be shared, but less good at “second best” social outcomes, and fail when asked to deliver outcomes under multiple complex constraints
- The “predict and provide” universal service utility model cannot effectively deliver efficiency, innovation or private sector investment

Universal empowerment of consumer participation in the energy market is critically important for the Low Carbon Transition and deliverable in smart

So release (i.e. stop suppressing) the cost reflective commercial signals for prices that vary strongly across time and space, put in place the enabling regulatory and market framework, support the necessary physical and technical innovation, let consumers experiment and place a safety net to protect the vulnerable ex post (without denying them the opportunity)

Thanks

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The opinions are those of the author