

Policy Development

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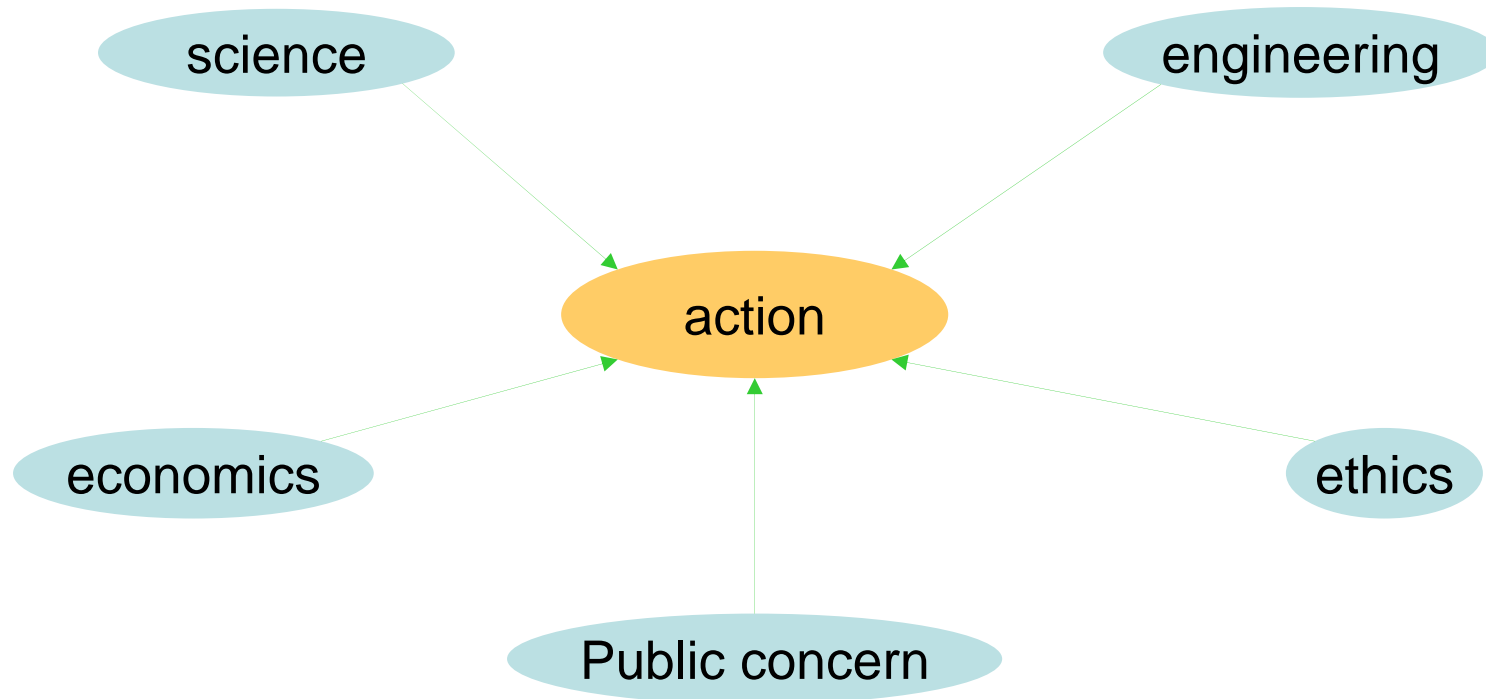
What should we do?

- ◆ Is it ever right to take action on uncertain evidence?

WHO: “yes”

link between exposure to ELF magnetic fields and childhood leukemia. Therefore the use of precautionary approaches is warranted. However, it is not recommended that the limit values in exposure guidelines be reduced to

What should we do?



Science: WHO

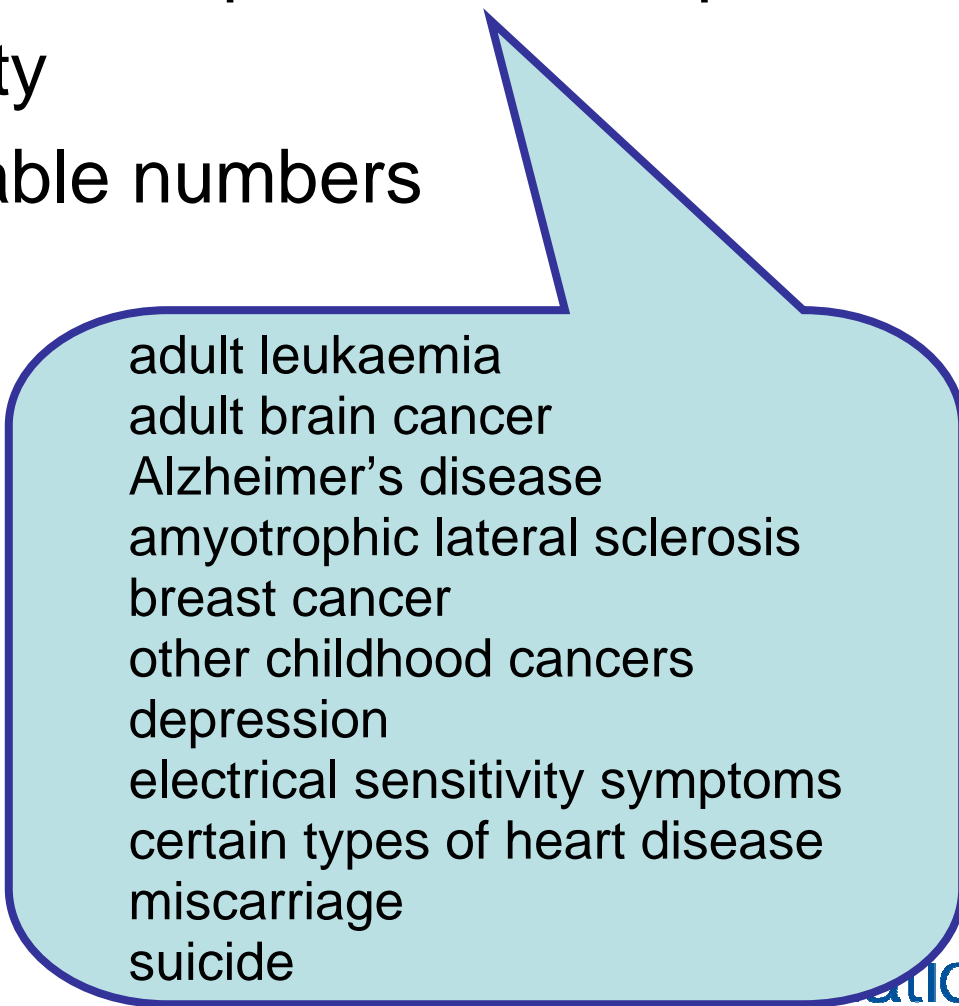
- ◆ EHC
 - ◆ Childhood leukaemia
 - ◆ Uncertainty
 - ◆ Low prevalence of exposure and disease

Hence “**very low-cost**”

should not compromise these benefits. Furthermore, given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukaemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus the costs of precautionary measures should be very low. The costs of implementing exposure reductions will vary from one country to another, making it very

Science: other perspectives

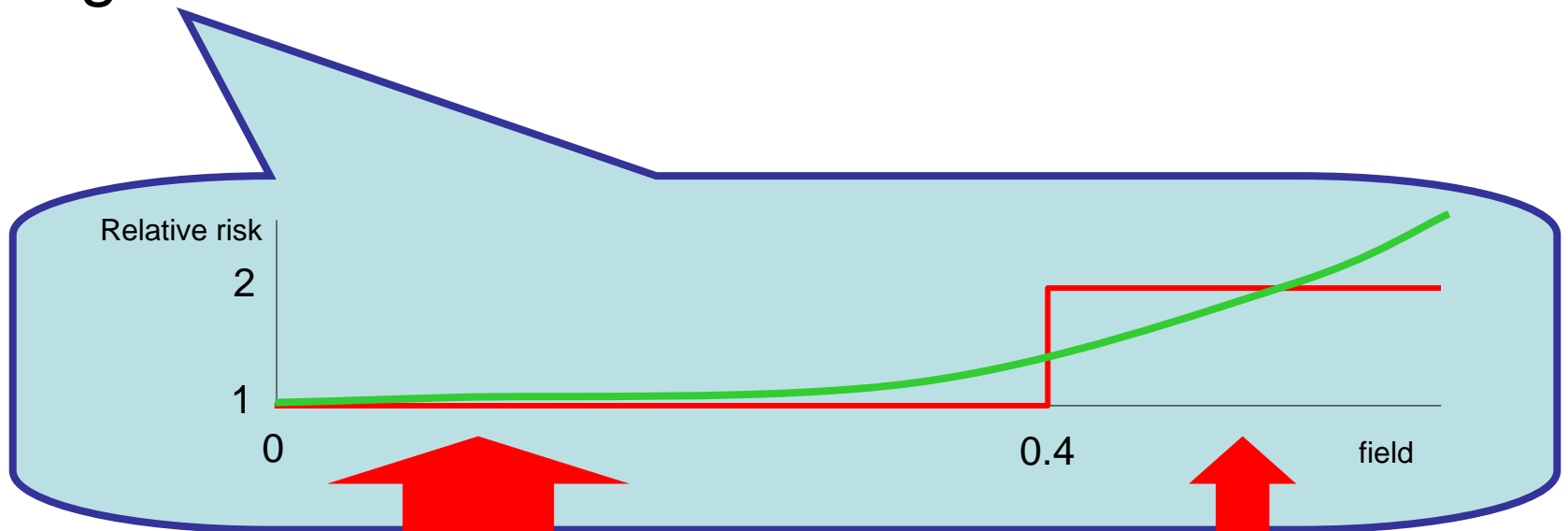
- ◆ Childhood leukaemia plus other endpoints
- ◆ Less uncertainty
- ◆ Larger attributable numbers



adult leukaemia
adult brain cancer
Alzheimer's disease
amyotrophic lateral sclerosis
breast cancer
other childhood cancers
depression
electrical sensitivity symptoms
certain types of heart disease
miscarriage
suicide

Science: other perspectives

- ◆ Childhood leukaemia plus other endpoints
- ◆ Less uncertainty
- ◆ Larger attributable numbers



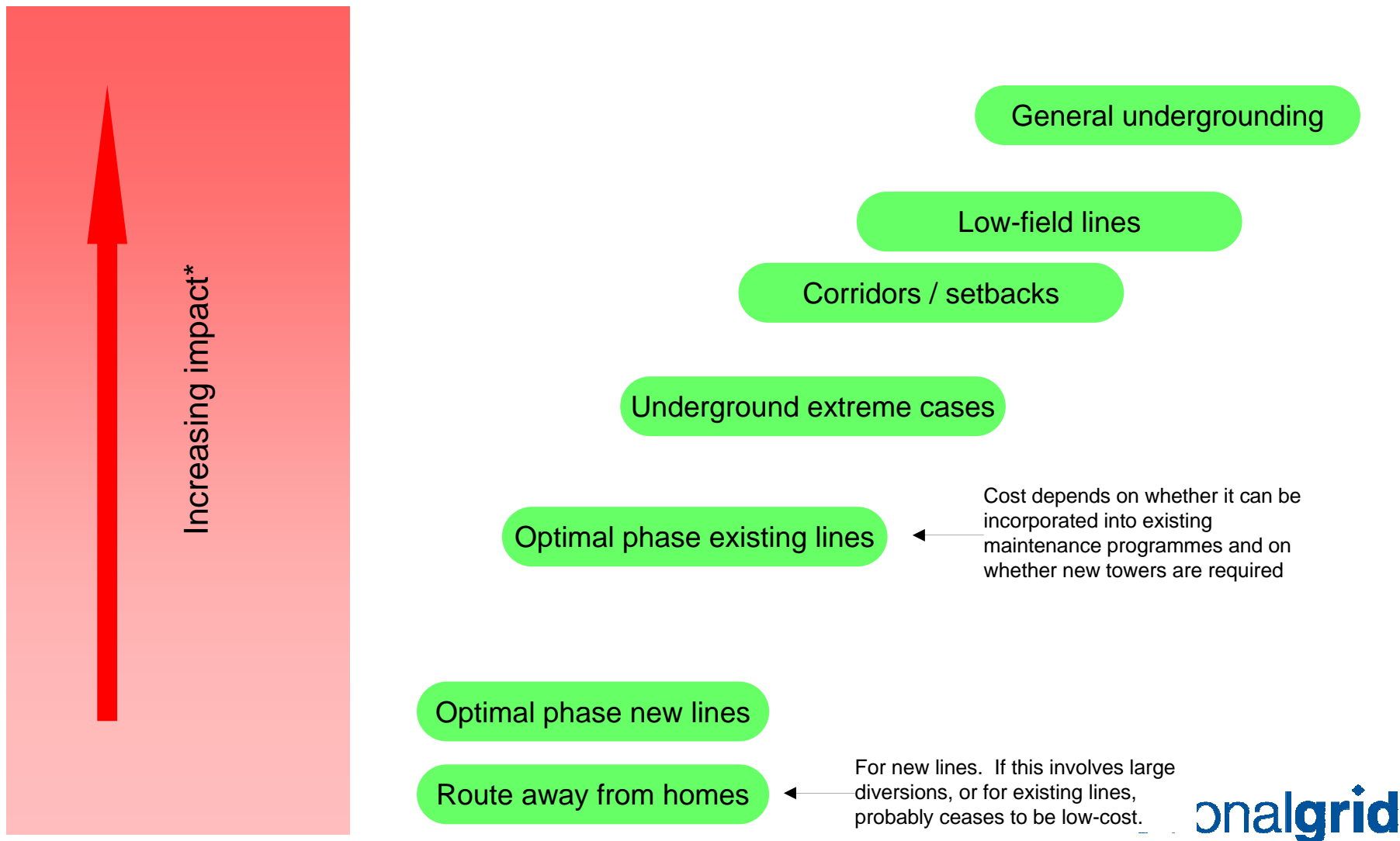
Alternative view
Small risk x larger numbers exposed
May add more in total

Conventional view
Risk above 0.4 μT
Small numbers

Engineering

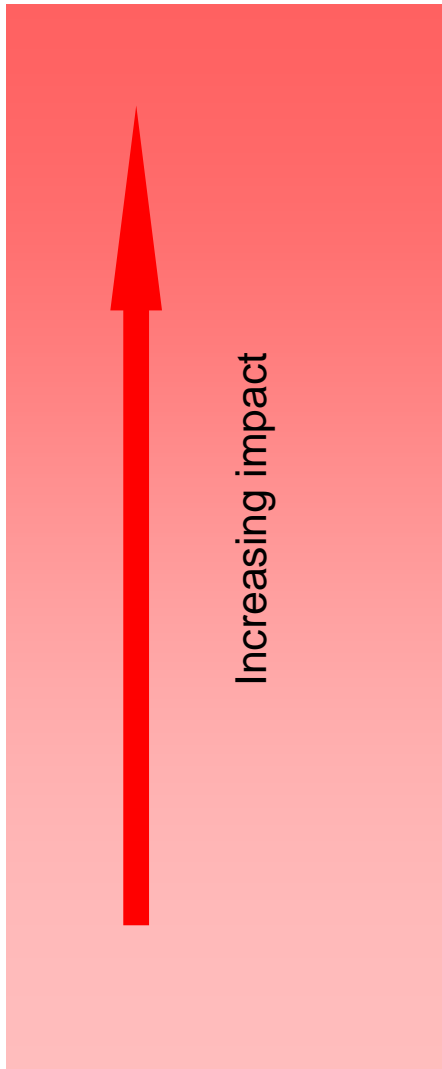
- ◆ Range of options

Options for HV power lines



*"impact" includes both financial and non-financial costs

Options for house wiring

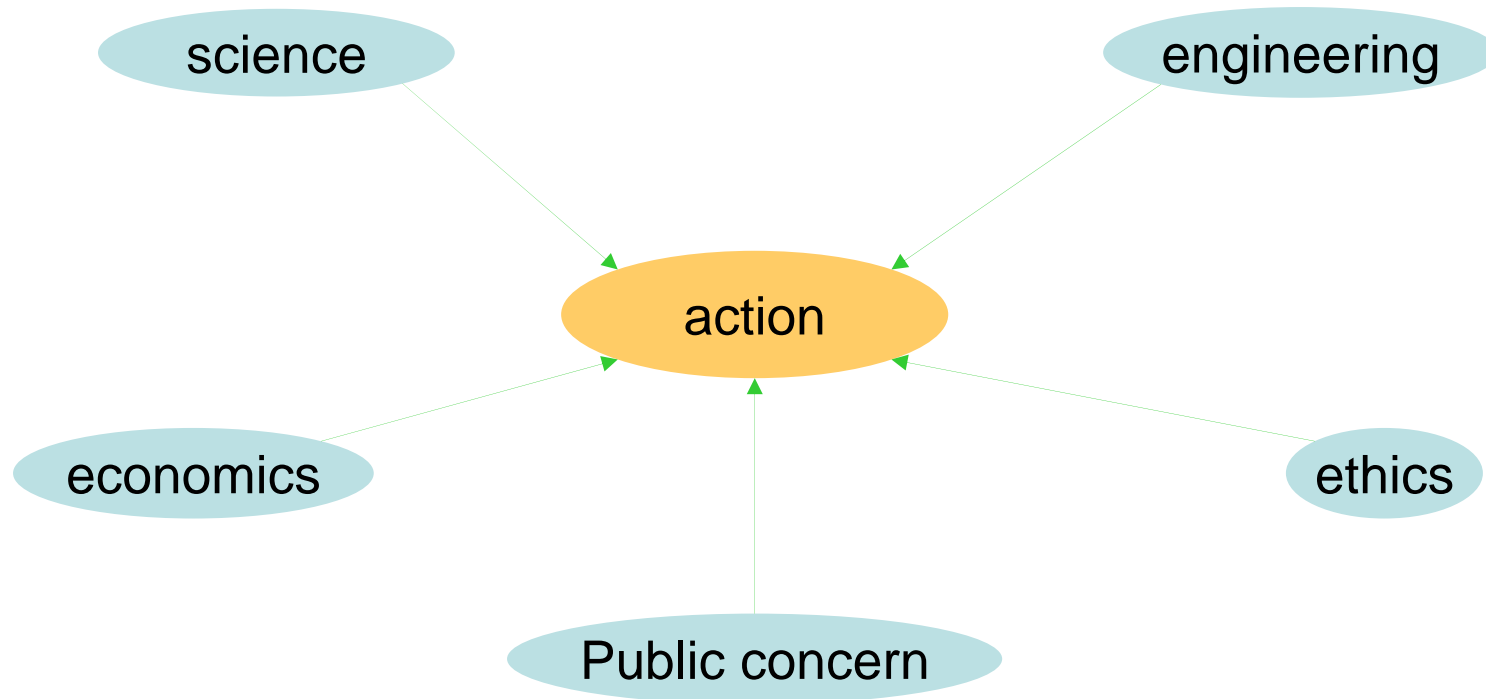


- screening
- Residual current circuit breaker
- Radial instead of ring main ← UK specific
- Go and return together
- Panel away from high occupancy
- Follow wiring codes

Options for distribution



What should we do?



Stakeholder Advisory Group on ELF EMFs (SAGE) Precautionary approaches to ELF EMFs



**First Interim Assessment:
Power Lines and Property, Wiring in Homes, and Electrical Equipment in Homes**

Date of issue: 27 /04/2007

SAGE cost-benefit calculation

“Corridors” / setback

Benefit:

0.5 - 1 case per year

Value of preventing that:
£25 - 50M

Cost:

Loss of value of land:
£1-2bn

Devaluation of existing homes:
£0-2bn

Adult fatality: £1M
x2 for cancer
x2 for children/involuntary
Non-fatal £0.5M
Overall value per case prevented £1.6M
Discount rate 3.5% pa
Assumed increase in value 2% pa
Period considered 50 years
=£50M per (case per year prevented)

SAGE cost-benefit calculation

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Cost:

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- ◆ Learning points:
 - ◆ Need to make assumptions
 - ◆ But nonetheless it is perfectly possible to do a cost-benefit analysis and get useful answers
 - ◆ The learning comes from the orders of magnitude – the details probably don't make much difference

SAGE cost-benefit calculation

UK: population 60M

Cases of childhood leukaemia: 450 pa

Attributable cases: 2

+ need to make
assumptions about risk and
exposure-response

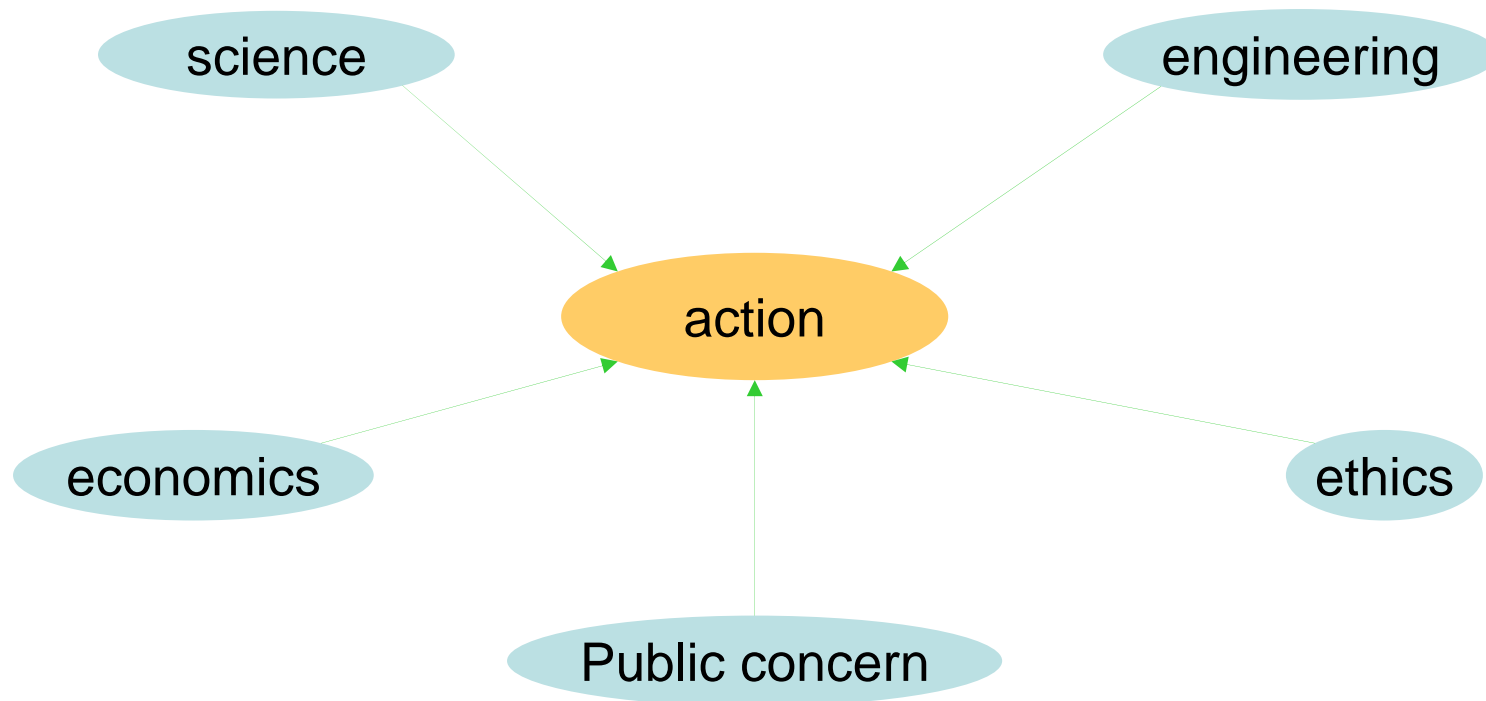
Benefit of removing from exposure of $0.4 \mu\text{T}$:

- ◆ All exposed homes in country: £100M
- ◆ All homes exposed due to power lines: £50M
- ◆ Each exposed home: £1k

! Country specific

- ▶ exposure levels
- ▶ WTP / VOSL

What should we do?



Options for HV power lines

Unlikely ever to be sensible

Sensible only if other health effects

Sensible in light of childhood leukaemia

Sensible to do it anyway

General undergrounding

Low-field lines

Corridors / setbacks

Underground extreme cases

Optimal phase existing lines

Optimal phase new lines

Route away from homes

WHO EHC
“very low-cost”

Options for house wiring

Unlikely ever to be sensible

Sensible only if other health effects

Sensible in light of childhood leukaemia

Sensible to do it anyway

There may be real scope for low-cost action here and house wiring may be a more significant source of high field than high-voltage power lines

screening

Residual current circuit breaker

Radial instead of ring main

Go and return together

Panel away from high occupancy

Follow wiring codes

Options for distribution

**Unlikely ever to be
sensible**

**Sensible only if
other health effects**

**Sensible in light of
childhood leukaemia**

**Sensible to do
it anyway**

This could have safety implications →

Change grounding practice

Spun secondaries / ABC

More effort to avoid ground loops

More effort on siting

Ways of implementing precaution

		What we do		
		Phasing	Setbacks	Underground
How we achieve it	General encouragement	✓ ✓	✓	?
	Specify the action	✓ ✓	✓	?
	Specify the cost	✓ ✓		
	Specify the field	✓ ✓	✓ ✓	✓ ✓

Do we know what to do?

Do
more



In recommending precautionary approaches, an overriding principle is that any actions taken should not compromise the essential health, social and economic benefits of electric power. In the light of the current scientific evidence and given the important remaining uncertainties, it is recom

No-cost / very low-cost
(as in EHC)

Science seen
as weaker

Concern about
downside

Philosophical
objections

Do
less



What to
reduce?

Do we know what to do?

