

INDUSTRIAL WATER MANAGEMENT

IMPLEMENTATION

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Implementation

- *Legislation*
- *Environmental Policy*
- *Education*
- *Economics*

Legislation

- *Current legislation is not effective:*
 - *if fines are too low it will be cheaper to pay the fine than to prevent pollution*
 - *if fines are too high industry will close the factory causing local hardship*
 - *legislation will only be effective if individual company directors are held responsible*

Legislation

TOP 10 UK POLLUTERS 1998

COMPANY	TOTAL FINES
ICI Chemicals	£382,500
Tyseley Waste Disposal	£ 95,500
London Waste	£ 38,500
Wessex Water	£ 36,500
Alco Waste Management	£ 30,000
Anglian Water Services	£ 24,250
EOM Construction	£ 21,000
Shell (UK)	£ 20,000
BNFL	£ 20,000
Celtic Energy	£ 18,000
European Vinyls	£ 18,000

“Clearly this is not sending out a strong enough message to deter large businesses that have the potential to seriously damage the environment.”

Ed Gallagher UK Environment Agency

Environmental Policy

- *What goes in comes out unless it stays there*
 - *Removing a contaminant from one phase into another is not the same as destroying it*
 - *gas emissions*
 - *sludge disposal*

Environmental Policy

- *Everything has to go somewhere*
- *Zero liquid discharge is possible*
- *Solid residue has to be disposed of*
- *Emissions to atmosphere may be unacceptable*

Environmental Policy

➤ Priorities

➤ environment or employment?

➤ industry or agriculture/fisheries

➤ Who should pay for pollution?

➤ industry?

➤ government (that is the community)?

➤ cui buono?

Environmental Policy

- *Every factory is different*
- *Consents must balance*
 - *environmental protection*
 - *industrial activity*
 - *they must be “fair” to both sides*

Education

- *Environment protection agencies must work with industry*
- *Both sides must understand*
 - *the need for long term environmental protection*
 - *the need for short term economic solutions*
- *Good water management practices will achieve both*

Education

“When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, your knowledge is of a meagre and unsatisfactory kind.”

William Kelvin, 1894

Education

- *Reduce water use by good manufacturing practice*
- *Reduce water contamination by good housekeeping*
- *Re-use water where possible*
- *Recycle water where practicable*
- *Recover raw materials*
- *Recover energy*

Education

- *Appropriate Technology*
 - *Matches wastewater characteristics to discharge criteria and recycle quality*
 - *Takes account of resources*
 - *utilities and chemicals availability*
 - *operating personnel*
 - *maintenance and spares availability*
 - *Is economically viable*
 - *Meets socio-political aspirations*

Education

- *Appropriate Technology*
 - *does not have to use “high tech” solutions*
 - *uses processes from other industries*
 - *needs the support of plant operators*

Economics

- *Economics is the language of industry*
- *Taxation (eg landfill tax) can be effective*
- *Increasing mains water costs focus attention on water*
- *Increasing sewer discharge costs focus attention on water*
- *Wastewater should be a resource*

Economics

- *The economic situation changes constantly*
 - *new processes become cheaper with widespread use (eg membranes)*
 - *landfill tax has made Advanced Oxidation Processes viable*
 - *technologies for Zero Liquid Discharge will soon become economically viable*
 - *sustainability can show economic benefits*

Economics

- *Industry must see a financial benefit from implementing water management*
- *Payback periods for industry are being reduced - 2 - 3 years is common*

Economics

So the message to industry is ...

Water Management

**WATER MANAGEMENT
SAVES
MONEY**

Summary

- *Industrialisation is important to developing economies*
- *Water is important to a healthy population*
- *Industry has a duty of care to minimise impact on water resources*
- *Industry does not respond positively to legislation*
- *Industry does respond to cost savings*

The Engineering Challenge

- *Technology is the easy bit*
- *Implementation problems are*
 - *Economic*
 - *Political*
 - *Sociological*
- *Constraints change with time*
- *Education is the long term solution*



Something to remember ...

Believe nothing because a so-called wise man said it

Believe nothing because a belief is commonly held

Believe nothing because it is written in ancient books

Believe nothing because it is said to be of divine origin

Believe only what you yourself judge to be true

Siddhartha Gautama, The Buddha