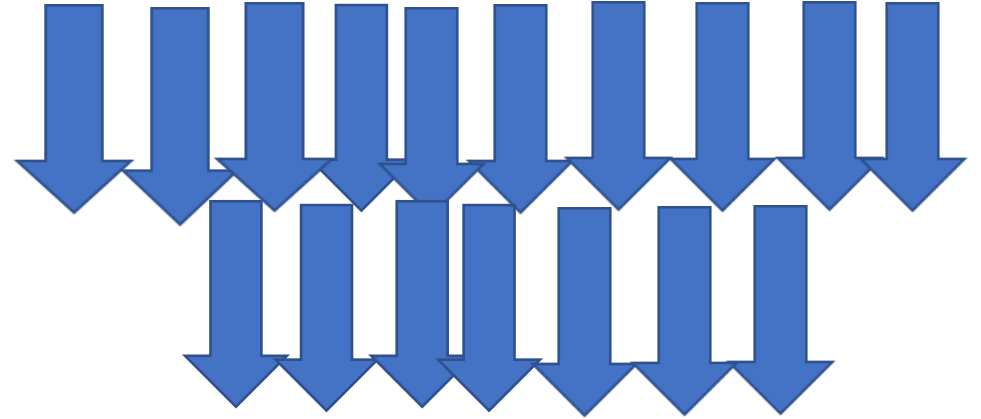


**Toxics Use Reduction:  
making workplaces safe  
for workers, communities  
& the environment**

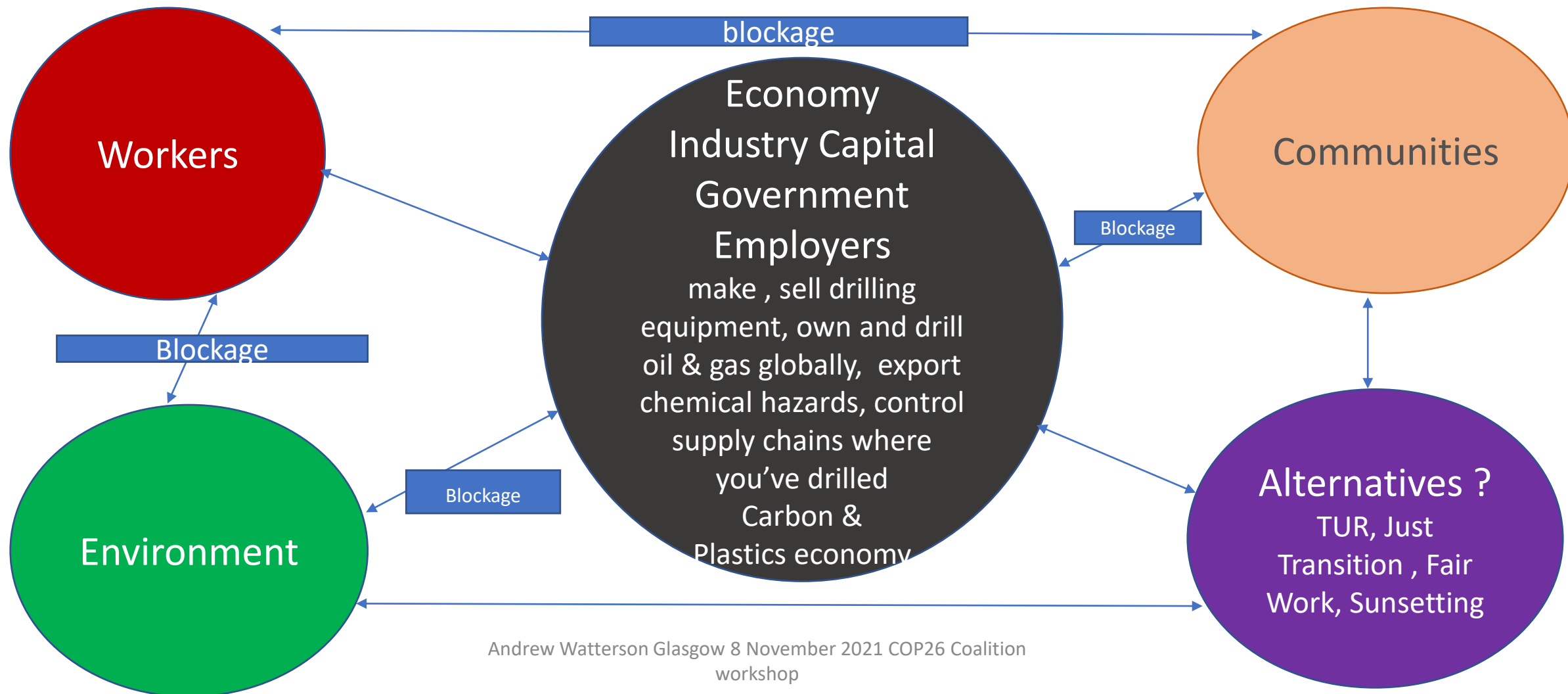
Andrew Watterson  
Stirling University

Carbon, Diesel , Benzene, Xylene (BTEX), PAHs VOCs, Formaldehyde  
Solvents, PM 2.5 and PM10  
Asbestos Silica Endocrine disruptors etc



# Workers, communities, environment. The oil and gas industry

Scotland's deadly carbon threads to their own & international communities ?



Oil & gas workers have an increased risk of cancer [mesothelioma, skin melanoma, multiple myeloma, prostate, urinary bladder. IARC 2021] , asthma, chronic obstructive pulmonary disease, hearing loss etc



Oil workers burn the gas to creating a flare.



Vanessa Nakate, Uganda : "Historically, Africa is responsible for only 3% of global emissions & yet Africans are suffering some of the most brutal impacts fuelled by the climate crisis.

# Boost for Scots oil and gas firm in Nig



By Mark Williamson | [@MarkWHerald](#)  
Group Business Correspondent

2019



Eland Oil & Gas has operations in the Niger Delta

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**ELAND Oil & Gas has received a boost after the Nigerian government approved the company's plans to develop another field in Nigeria.**



# What is toxics use reduction (TUR)?

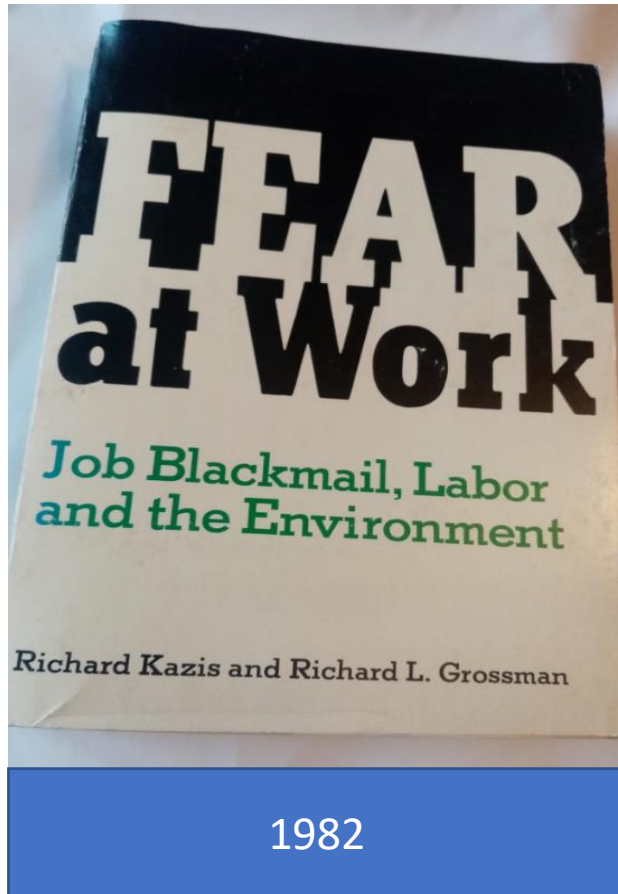


Toxics Use Reduction Act  
1989 Massachusetts

- A set of tried and tested principles and practices to remove or reduce toxic substances including those that damage our climate through air, water and soil pollution and damage the health and safety of workers & communities who produce, use or may be exposed to them
- TUR links directly to environment and green jobs, control of work and jobs, alternative economic strategies & plans, sustainability and climate change with economic and health benefits to all. It also includes ways to address export of toxic substances including carbon to LMICs and
- Win win win win – cuts or removes hazardous substances in work and wider environments to benefit workers, employers, communities and the environment



# Old problems and new solutions?



## Goals of the Massachusetts TURA 1989

- Achieve 50% reduction in byproduct (waste) by 1998 through required company plans
- Establish toxics use reduction as the preferred means of compliance
- Assist local employers
- Reduce the production and use of toxic chemicals

## Results

**Between 1990 and 2016, companies in Massachusetts reduced toxic chemical use by 66%, by-product production by 72% and onsite releases by 92%. 1400 chemicals now covered by reporting requirement**

# Challenges for TUR since 1980s

## **Problem shifting: unforeseen consequences? Rarely inevitable**

manufacturer/supplier/employer for 'environmental reasons' shift hazards to worker, vulnerable community.  
Cobalt for electric cars?

environment to worker shift? Plastics in wind turbine production/maintenance

## **TUR 'regrettable substitutes' risks with climate impacts?**

n-hexane for trike (TCE)

BPS for BPA

Solvents for water

OPEs for brominated fire retardants often not needed



*An artisanal miner carries raw ore at Tilwizembe, a former industrial copper-cobalt mine, outside of Kolwezi, the capital city of Lualaba Province in the south of the Democratic Republic of the Congo, June 11, 2016 Kenny Katombe / REUTERS*

# Mossmorran Fife: ExxonMobil and Shell: what could and should be possible using ambitious TUR in Scotland to avoid impacts in countries like Nigeria?

ExxonMobil's Ethylene Cracker Plant supplies chemicals for plastics. Shell's plant separates gas & associated liquids taken from under the North Sea into propane, butane & natural gasoline & supplies ethane to ExxonMobil. Both with big carbon footprints, community impacts & questions about air pollution. ACTIONS NEEDED?

- Cut plastics use, recycle etc plus TUR. Green chemistry researchers identified bio-based alternatives to oil & gas based ethylene for plastics (polyhydroxyalkanoates, polymerise by fermenting glucose, modify starch & cellulose)
- ExxonMobil and Shell effectively ignored green chemistry solutions over the decades. They are not present in the Scottish Government initiative, Industrial Biotechnology Innovation Centre, started in 2014 that looks for plant based alternatives to fossil fuels. **Ineos had an agreement in 2015 to supply ExxonMobil and Shell with US shale gas for the ethylene plant**
- Scottish Government to move from warm words and blah blah blah to phase out these industries with rapid just transition & stop equivocating on the Cambo oil field and the Scottish oil industry. No half measures will work.



The New Coal. The US plastics industry's contribution to climate change is on track to exceed that of US coal-fired power by 2030 and reliant on fracked gas  
<https://www.bennington.edu/news-and-features/new-coal>. 2021



# Four action points - local, national & international

## Protect the planet, Protect communities, Protect workers

- Apply TUR now at workplaces & in legislation. No need for delay
- Use TUR strategies in Scotland and beyond with better monitoring, exposure standards, & regulation/inspection operate along with empowered trade unions & community input
- Use precautionary upstream principles on toxics that affect workers, communities, climate
- Draw on green engineering, green construction & building, and green chemistry in TUR