



The Lead Education and Abatement Design Group
Working to eliminate lead poisoning globally and to protect the
environment from lead in all its uses: past, current and new uses
ABN 25 819 463 114

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Chronology of Leaded Gasoline / Leaded Petrol History -

Knowledge of the dangers of lead in petrol / gasoline;

Steps taken and not taken, to phase out leaded petrol;

Steps remaining to achieve global leaded petrol phase-out.

By Elizabeth O'Brien, Manager, Global Lead Advice & Support Service (GLASS) run by The LEAD Group Inc. Australia. Partner, UNEP Partnership for Cleaner Fuels and Vehicles (PCFV) and Zac Gethin-Damon, LEAD Group Campaigner for the End of Leaded Petrol Globally by the End of 2011, edited by Anne Roberts for The LEAD Group Inc.

- 1921 Dec – tetra-ethyl lead (TEL or “ethyl”) was tested for its anti-knock properties for the first time in gasoline, at the GM labs in Dayton Ohio by Thomas Midgley (Kovarik 2011) who was posthumously declared to be “responsible for more damage to Earth's atmosphere than any other single organism that has ever lived.” (Walker 2007)
- 1923 Feb - the first commercial sales of leaded gasoline took place in Dayton, Ohio. (Kovarik 2011)
- 1923 June - the US public health service made aware of the leaded gasoline and started asking for safety tests. (Kovarik 2011)
- 1923 Sept - workers started dying in the DuPont TEL works... “sickening deaths and illnesses of hundreds of TEL workers... Gripped by violent bursts of insanity, the afflicted would imagine they were being persecuted by butterflies and other winged insects before expiring, their bodies having turned black and blue.” (Kitman 2000a)
- 1925 Apr - Yale university public health scientist claims Ethyl gasoline represents "the greatest single question [whether leaded gasoline is safe] in the field of public health which has ever faced the American public." (Kovarik 2011)
- 1925 May 20 - US Public Health Service holds conference (PHS US 1925) to discuss viewpoints on Ethyl controversy and appoints blue-ribbon committee to conduct independent inquiry. Consideration of alternatives to lead as anti-knock is suspended as conference is cut back from two to three days to only one day. (Kovarik 2011)

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1926 Jan 26 - PHS committee finds "no good grounds" for prohibiting Ethyl gasoline but insists on continued tests. No independent tests conducted until 1960s. List of alternatives to tetraethyl lead proposed by C.E.A. Winslow of Yale kept from final report. (Kovarik 2011)

1928 - New York City ends its ban on leaded gasoline. (Kovarik 2011)

1953 - First post-war concerns about lead as air pollutant surface in Los Angeles. General Motors follow issues closely (Kovarik 2011) [preparing to argue case for continuing to produce TEL]

1954 - A young academic at King's College London, (later Professor) Derek Bryce-Smith first concerned (about the health effects of leaded petrol) when he asked the manufacturers for a sample of the kind of lead added to fuel for use in an experiment. "I got a phone call to say they did not want to make it available because it was extremely toxic," he later recalled. "They finally gave me some, but told me that if I spilt any on the floor, I would have to take the whole floor up. And if I got any on my finger, it would be absorbed through my skin and drive me mad or kill me." (Lean 2011)

1960 - Tetramethyllead introduced as an additive to automotive fuel.

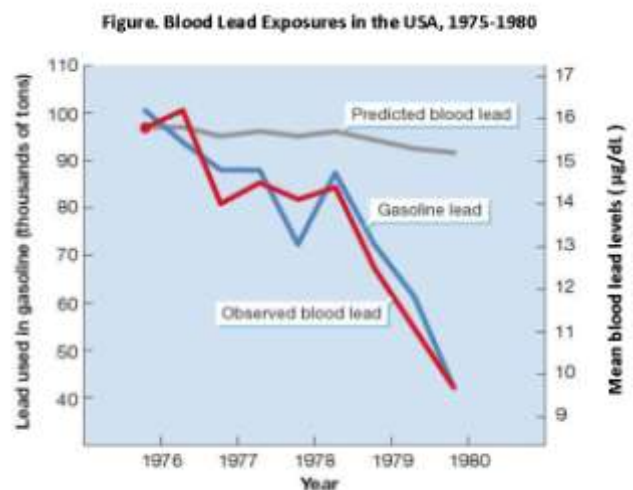
1960-1975 – A 2010 study stated that "the PbB [mean blood-lead level] during the peak years of maximum leaded gasoline usage (1960–1975) could be estimated at about 48 µg/dL [micrograms per decilitre]" and possibly as high as 63 and: "The extrapolated peak level of 48 µg/dL (range 40 to 63) is associated with clinical and behavioral impairments, which may have implications for adults who were children during the peak gasoline lead exposure leaded gasoline emission was the predominant source of lead exposure of African-American Cleveland children during the latter two-thirds of the 20th century." (Robbins et al 2010)

1965 Sept – Clair Patterson publishes "Contaminated and Natural Lead Environments of Man," the first research to show that high lead levels in industrial nations are man-made and endemic. (Arch Environ Health. 1965 Sep; 11:344-60) (Kovarik 2011), thus beginning his campaign to phase-out leaded gasoline and lead solder in food cans.

1966 – US Congressional hearings on air pollution lead to long debate about new agencies and new regulations. (Kovarik 2011)

1969 - WHO Expert Committee reports on ambient air lead concentrations; non-urban sites show less than 0.5 µg/m³ [micrograms per cubic metre], while urban sites have values ranging from 1 to 5-10 µg/m³. Highest levels recorded on highways during rush hours, 14-25 µg/m³. (IPCS 1977)

1970's - a legal basis for the precautionary principle is established by a court decision called the Ethyl decision involving banning leaded gasoline. (Charnley 2000)



In the 1970s, research showed that low environmental levels of lead exposure could cause permanent learning and behavior problems in children exposed before birth and in infancy and toddlerhood. Lead paints and leaded gasoline were

the major sources of exposure. Efforts to reduce lead exposure began in 1975-76 when lead paints were banned and leaded gasoline was phased out.

Exposure models predicted that lead levels in the population would change very little, but biomonitoring at the CDC found the opposite: as lead levels in gasoline declined, so did blood lead in the US population. Today, the average US citizen has a blood lead level under 2µg/dL. The level that triggers public health action to prevent further exposure is 5µg/dL, and the average 1976 blood lead level is now considered lead poisoning.

1970 – US Environmental Protection Agency created. Car manufacturers ordered to begin building engines to run on unleaded gasoline by 1975. Ethyl Corp. unsuccessfully opposes phase-out of leaded gasoline in courts.

1970 – US auto makers develop catalytic converter as a stop-gap technology while they develop cleaner engines. TEL poisoned the catalytic converters so the pressure was on to get lead-free gasoline (petrol) on the market to permit catalytic converters. In response to this the US Environmental Protection Agency (EPA) orders introduction of unleaded gasoline and issues an order for lead-gasoline-free cars by 1975, thus beginning the world's first national phase-out of leaded petrol. A health model predicted that the effect of the introduction of unleaded gasoline on lead concentrations in the blood of US residents would be minor. Ref and graph (adapted from USCDC) (Murdoch 2005)

1971 July – Japan introduces a maximum permissible level of 0.31 grams of lead per litre (IPCS 1977) which may have been the first such restriction and thus the first national lead-in-petrol phase-down policy.

1972 Apr – Unleaded petrol begins to be marketed in Japan. (IPCS 1977)

1975 - New US car models made with catalytic converters which require unleaded gasoline. Ethyl Corp. unsuccessfully proposes "lead tolerant" catalytic converters. (Kovarik 2011)

1976 Mar – US Court of Appeals ratifies maximum permissible level of 0.13 g of lead per litre of gasoline by 1 January 1979. (IPCS 1977)

1977-82 - Extensive tests by public health scientists show marked correlations between high levels of lead in children's blood and brain damage, hypertension and learning disorders.

1981 – The US EPA notes that between 1970 and 1979 a 41% drop in the composite maximum quarterly average of ambient air-lead concentrations at 105 sites across the nation was accompanied by a 40% drop in the amount of lead consumption in gasoline, excluding sales to the military. (Pirkle Et al 1983)

1983 June - The Second National Health and Nutrition Examination Survey (NHANES II) reveals a precipitous decline in blood lead levels in all segments of the US population, a drop of 37% (from 14.6 to 9.2, a drop of 5.4 micrograms per deciliter) between Feb 1976 and Feb 1980, closely paralleling the contemporaneous decline in the amount of lead added to gasoline. [See graph above.] (Pirkle et al 1983)

1984 - City of Chicago first to order end of all leaded gasoline sales since New York City ended ban on leaded gasoline in 1928. (Kovarik 2011)

1985 – US EPA’s estimates based on Pirkle et al (1983) indicate that lead in gasoline in the United States may be responsible for well over one million cases of hypertension per year and for over 5,000 deaths from heart attacks, strokes, and other diseases related to blood pressure. Moreover, these estimates cover only males aged 40 to 59 and, in the case of heart attacks, strokes, and deaths, only white males in that age group. In their estimation of the total benefits of a phase down of gasoline some other impacts were also addressed, for example Children’s Health Effects. US EPA’s estimation of the total benefit of a phase down of leaded petrol was: “7.9 billion, while the estimated cost is only \$607 million, resulting in net benefits of \$7.3 billion”. (Schwartz et al 1985)

1986 – Japan (probably due to its Minamata mercury tragedy and high value placed on IQ and longevity, or perhaps due to pressure from its auto-makers to be able to include catalytic converters on all new vehicles) became the first nation to fully phase-out leaded petrol.

1990 - World Health Statistics Quarterly declares lead in petrol to be “*The Mistake of the 20th Century.*” (Shy, 1990) Consumption of lead in OECD countries for gasoline additives drops from 10% of 3,050,000 tonnes of lead used in 1970 to 2% of 3,365,000 tonnes in 1990 (IPCS 1995) (see pie charts below).

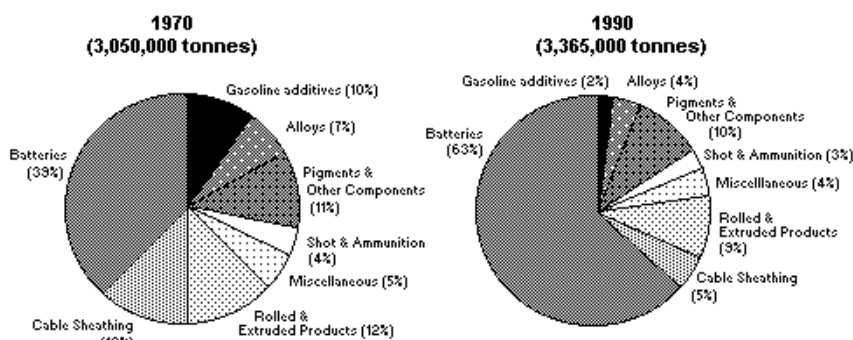


Fig. 1. Utilization of lead in OECD countries in 1970 and 1990 (From: OECD, 1993)

1991 - the Organisation for Economic Cooperation and Development (OECD) determines that phasing out leaded gasoline was the most important lead poisoning prevention action any national government could take. (OECD 1991)

1991 – US Centers for Disease Control (CDC) redefines childhood lead poisoning by declaring that a blood lead level below 10 µg/dL (micrograms per decilitre) does not constitute lead poisoning. (CDC 1991)

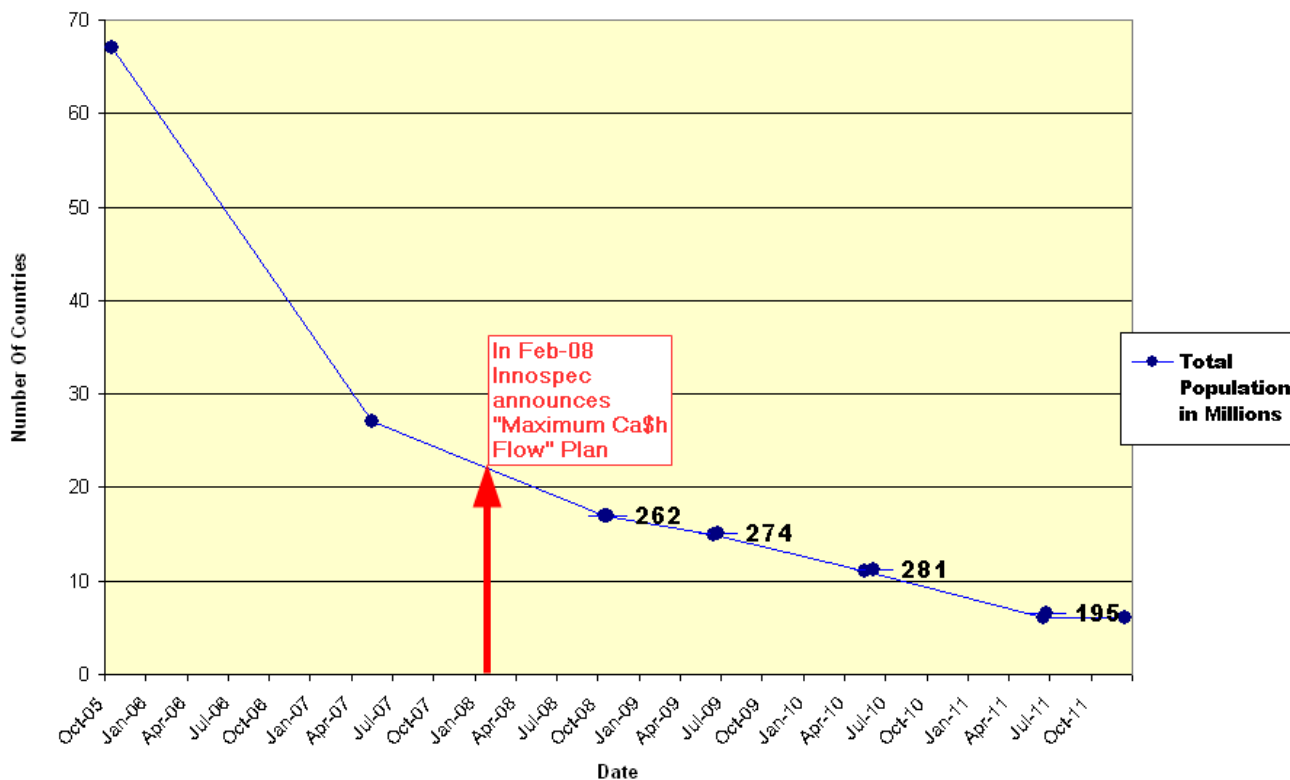
1992 – In the seminal book *Human Lead Exposure*, edited by Herbert Needleman, JS Lin-Fu states that some consider the addition of lead to gasoline is one of the greatest public health disasters of the 20th century. (Gilbert and Weiss 2006) Australian NGO The LEAD Group lobbies Australian Environment Minister Ros Kelly to speed up Australia’s phase-out (begun in 1985 and finally achieved in 2002)

1993 - Ethyl Corporation ends manufacture of lead anti-knock compounds with the closure of its Canadian plant; instead markets additives purchased from the Associated Octel Company Limited (later renamed “Innospec”), the world’s only remaining producer of tetraethyl lead (TEL). (Albermarle 2011)

- 1994 – Study shows that US blood-lead levels declined by 78 percent from 1978 to 1991 (Kitman 2000b). US researchers declare: “lead poisoning remains the single most significant preventable disease associated with an environmental and occupational toxin”; and “Although lead in gasoline represents only 2.2 percent of total global lead use, leaded gasoline is by far the single most significant source of lead exposure in urban areas”. UN Commission on Sustainable Development calls on all governments to eliminate lead from gasoline. (World Resources Staff 1998)
- 1994 Feb 1 – Major emergency toxic leak occurs at Associated Octel (later renamed “Innospec”) TEL plant in Ellesmere Port, UK, resulting in: the company later pleading guilty to the charges that it failed to ensure the health and safety of workers and other persons; paying a fine of £290,000; and installing a new ethyl chloride plant. (Ryder 1996)
- 1994 Apr - “the UN Commission on Sustainable Development called upon governments to eliminate lead from gasoline worldwide. This action set in motion decisions and efforts in other international fora and institutions - including the Summit of the Americas, World Bank, Habitat II, OECD, and the UNECE - to encourage and assist nations to take action to phase out this principal source of lead pollution, which continues to harm the health of millions of people.” (Walsh 1999)
- 1995 Dec – US phases out leaded gasoline for road-use vehicles and US EPA issues press release stating: “The elimination of lead from gas is one of the great environmental achievements of all time,” [EPA Administrator Carol M] Browner said. “Thousands of tons of lead have been removed from the air, and blood levels of lead in our children are down 70 percent. This means that millions of children will be spared the painful consequences of lead poisoning, such as permanent nerve damage, anemia or mental retardation.” The actions taken today, although procedural, mark the end of a quarter-of-a-century of work to keep Americans safe from exposure to lead from gas.” (EPA US 1996)
- 1996 - World Bank calls for world phaseout of leaded gasoline (Kitman 2000b) and UK Friends of the Earth declares Octel Britain’s filthiest factory in 1996. “Octel are reported to have released a total 5,340 tonnes (around 14 tonnes a day) of highly poisonous chemicals. These include chloroethane, vinyl bromide, and about 66 tonnes of lead, into the atmosphere about a town of between 70-80,000 residents.” (Ryder 1999).
- 1996 - *Lead in Australian Children: Report On The National Survey Of Lead In Children* reports that: “In single-vehicle households the mean blood lead level [of children aged 1 to 4 years (inclusive)] is higher where the vehicle uses leaded petrol [6.62 µg/dL - 133% higher] than when it uses unleaded petrol... or [in households with two or more vehicles] than when all vehicles use unleaded petrol [4.97 µg/dL].” (Donovan et al 1996)
- 1996 Feb 20 - OECD member nations sign a Lead declaration placing lead petrol phase-out as the number one action for each OECD country. (OECD 1996)
- 1998 – The World Bank reports: “the exposure of adults to atmospheric lead has been connected to elevated blood pressure causing hypertension, heart attacks and premature death. *No lower threshold of exposure exists under which the adverse effects of lead on children and adults cannot be detected*”... “the magnitude of benefits estimated in the United States suggests that phasing out lead from gasoline is likely to produce substantial benefits in all countries.” (Lovei 1998)

- 2000 - European Union bans leaded gasoline at the pump. (Kitman 2000b)
- 2000 Mar 20 - Kitman declares: “the benefits of lead antiknock additives were wildly and knowingly overstated in the beginning, and continue to be. Lead is not only bad for the planet and all its life forms, it is actually bad for cars and always was.” (Kitman 2000c)
- 2002 – World Summit on Sustainable Development (WSSD) takes two decisions to protect children’s health from exposure to lead. Firstly, the WSSD Plan of Implementation (POI) called for: *“Supporting the phasing out of lead in gasoline.”* One result of WSSD 2002 was that the United Nations Environment Programme (UNEP) set up the Partnership for Cleaner Fuels and Vehicles (PCFV) with a core goal of global elimination of leaded petrol.
- 2002 Dec 27 - *Study links early adult deaths to lead - 30 million in U.S. could be at risk* – US researchers find that even low levels of lead in the blood, [mainly due to the use of leaded gasoline] raise blood pressure and are predicted to cause early death in as many as 30 million US adults. (Kotulak 2002)
- 2003 – The LEAD Group became the first Australian Partner of the PCFV and took a “watch and learn” attitude to see how the United Nations goes about achieving its goals. A: slowly.
- 2003 Oct 28 – “IPIECA’s [International Petroleum Industry Environmental Conservation Association] Fuels and Vehicles Working Group addresses environmental issues related to the refining and distribution of fuels, in particular working towards the elimination worldwide of the use of lead as an additive in motor gasoline. IPIECA believes that the worldwide development of catalytic car exhaust technology, which leads to cleaner air in urban areas, should not be inhibited and that the developing world should benefit from modern fuels which are available now in most countries. The removal of lead is important to public welfare because it will allow the introduction of widely available vehicle catalytic exhaust technology to improve air quality.” (IPIECA 2003)
- 2005 – “At a 2005 [PCFV] Partnership meeting held in Kenya, it was agreed that the partnership was on course to “phase out leaded gasoline by the end of 2008 worldwide.” (IFCS and US 2008) The LEAD Group first to publish a tally of countries still selling leaded petrol: 67 countries as at International Lead Poisoning Awareness Day, Oct 20. (O’Brien and Aitken 2005) - see graph for progress towards phase-out. NB Dec 31st 2011 is The LEAD Group’s target date for the end of the sale of leaded gasoline globally. See LEAD Group graph below.

Total Population (in Millions) In Number Of Countries Still Selling Leaded Petrol, By Date



(Data Sources: O’Brien and Aitken 2005, O’Brien 2007, Taylor 2008, Taylor 2009, Taylor 2010c, Taylor 2011)

2006 Jan – only remaining manufacturer of TEL changes its name from Octel to Innospec – “The name change was meant to emphasize that the firm, which had sales of \$528 million last year, now gets two-thirds of its sales from non-lead fuel additives and other specialty chemical businesses it has built over the years. "Lead is a declining product" that was associated with the Octel name, Jennings [Innospec's President and Chief Executive Officer] says.” (Reisch 2006)

2006 Jun 6 - SAICM (Strategic Approach to International Chemicals Management) releases *Global Plan of Action*: including: “Work areas addressing risk reduction (objective 1) Activit[y]: Eliminate lead in gasoline. Actors: National Governments, IOMC (UNEP, WHO, UNIDO, UNDP, World Bank), GEF, Industry. Targets/Timeframes: 2006-**2010**. Indicators of Progress: Lead in gasoline is eliminated. (SAICM 2006)

2006 Aug 23-25 – correspondence between The LEAD Group and Innospec: Incoming Email: Enquiry from Innospec Inc. website re: is Australian lead used to make lead petrol? Innospec: We do not purchase our lead directly from Australia, but use a third party supplier. Outgoing email: Who? Incoming email: I understand it's Britannia [Britannia Refined Metals, BRM, a subsidiary of Xstrata]. (Sullivan and Farey 2006)

2006 Sept – US researchers propose a public health action level of 2 µg/dL replace the 1991 intervention blood lead level of 10 µg/dL for children due to “scientific, ethical, social, economic, and public health considerations” and because 2 µg/dL “represents a reasonable blend of scientific information, feasible policy alternatives, and analytical reliability.” (Gilbert and Weiss 2006)

- 2006 Sept 9 – The LEAD Group web-publishes *Lead Mining Stewardship - Grey Lead and the Role of The LEAD Group* fact sheet, proposing: “preventing lead from mining companies from being sold to the one manufacturer who uses lead to make the leaded petrol additive, that is, Innospec in the UK. If Innospec could not buy lead, hundreds of millions of children in the ... countries still selling leaded petrol would not have to wait until 2010 for the SAICM ... goal of a global lead petrol ban to be achieved.” (O’Brien et al 2006)
- 2008 – Beijing PCFV meeting acknowledges it will fail to meet its original target of a 2008 global leaded gasoline phaseout. The LEAD Group calls for a ban on Australian lead exports for TEL for road-use and asks Xstrata to stop supplying lead to Innospec via Britannia. (O’Brien et al 2008) and (O’Brien and Sara 2011)
- 2008 Feb 25 – Innospec state in their annual report for 2007: “We intend to manage the decrease in the sales of TEL for use in automotive gasoline to maximize the cash flow through the decline” (see the resultant slowdown in the rate of progress in the graph of of leaded petrol countries above) and “The Company expects that it will cease all sales of TEL for use in automotive gasoline at some time in the next several years.” (Innospec 2008)
- 2009 Feb 20 – Innospec reports on Market Watch Website: “We expect that we will cease all sales of TEL for use in automotive gasoline in 2012.” (Innospec 2009)
- 2009 Sep – Germany sets new reference values [action levels] for blood lead, based on the 95th percentile of results of national blood lead surveys: 3.5 µg/dL as the goal for children (up to the age of 12) and for men and women - currently 9 µg/dL and 7 µg/dL respectively (Schulz et al 2009). These new goal blood lead levels are still the most stringent in the world as at 9 Dec 2011. Such low blood lead goals could not be achieved in any country still dependent on leaded gasoline but blood lead testing results in those countries still selling leaded petrol such as Afghanistan and Yemen, promised by PCFV (UNEP 2011), have not been forthcoming as at 9 Dec 2011.
- 2009 Sep 22 – The LEAD Group web-publishes *Dangers of a blood lead level above 2 µg/dL and below 10 µg/dL to both adults and children*. (Roberts et al 2009)
- 2010 Mar 18 - *Securities & Exchange Commission [SEC] v. Innospec, Inc., Civil Action. SEC FILES SETTLED FOREIGN CORRUPT PRACTICES ACT CHARGES AGAINST INNOSPEC, INC. FOR ENGAGING IN BRIBERY IN IRAQ AND INDONESIA WITH TOTAL DISGORGEMENT AND CRIMINAL FINES OF \$40.2 M.* (SEC 2010). The US SEC Complaint against Innospec names relevant entity Swiss-based Alcor, “a wholly owned subsidiary of Innospec” and states Alcor’s “financial results were consolidated with those of Innospec throughout the relevant period [2000-2007]”. (UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA 2010)
- 2010 July – Iraqi service station workers study finds the median (range) 14.1 (7.5-56) µg/dL lead in the blood of fuel stations workers was significantly higher [217% higher] than 6.5 (4.0-1.6) µg/dL in the controls (non-lead exposed workers). (Al-Rudainy 2010)
- 2010 Dec 2 – The LEAD Group updates 2009 annotated bibliography and web-publishes *Dangers of a blood lead level above 2 µg/dL and below 10 µg/dL to adults* (Taylor 2010a) and *Dangers of a blood lead level above 2 µg/dL and below 10 µg/dL to children* (Taylor 2010b).

2011 April –The estimated global annual impacts of lead in vehicle fuels found [by Hatfield and Tsai in a United Nations-commissioned report currently being peer-reviewed and expected to be published in 2011] to be significant:

- Close to **1.1 million deaths**;
- A loss of **322 million IQ points**;
- Close to **60 million crime cases**;
- Economic loss of **USD 2.4 trillion** per year (4% of global GDP)

(PCFV, UNEP 2011)

2011 June 17 – The LEAD Group updated <http://www.lead.org.au/fs/fst27.html> to show Afghanistan, Algeria, Iraq, Myanmar (Burma), North Korea and Yemen are the six remaining countries where leaded gasoline is possibly still being sold. (Taylor 2011)

2011 June 28 – The LEAD Group publishes *LEAD Action News V11N4 - Who will end the leaded petrol death trade?* Newsletter includes a UTS intern’s research examining possible reasons preventing the above 6 remaining countries from phasing out leaded petrol (Roberts and Cooper 2011) and identifies 6 people who could act to end the era of leaded gasoline by the end of 2011: **Ivan Glasenberg**, Australia’s 2nd-most wealthy citizen, CEO of Xstrata; **David Cameron**, Prime Minister of the UK; **Julia Gillard**, Prime Minister of Australia; **Barack Obama**, President of the USA; **Micheline Calmy Rey**, President of Switzerland; and **Patrick Williams**, Innospec’s CEO. (O’Brien and Roberts 2011)



Patrick Williams

2011 June 28 – The LEAD Group asks US President Barack Obama: “Please ask SEC to seek further reparation from Innospec by ordering the company to stop making TEL for road use, and to buy back all stocks of TEL and pay for its transport back to the UK.” (O’Brien 2011a) [No reply received as at the date of this chronology, although Elizabeth has been advised by email on 10 Dec 2011 that a response is being prepared.]

2011 June 28 – The LEAD Group asks Swiss President Micheline Calmy-Rey to ask UK-incorporated Swiss mining giant Xstrata to stop supplying lead to Innospec and ask Alcor to make reparation by ordering them to stop supplying TEL for road use, and to buy back all stocks of TEL and pay for its transport back to the UK, (O’Brien 2011b), and was advised by her, in a letter dated Aug 2: “Switzerland is committed to the OECD Guidelines for Multinational Enterprises [OECD 2011]. Your letter will therefore be forwarded to the Swiss National Contact Point (NCP).” (Calmy-Rey 2011)

2011 June 28 – The LEAD Group asks Australian Prime Minister Julia Gillard to ban the export of lead that was destined to be made into leaded petrol. (O’Brien 2011c) Nov 15 reply received from Senator Don Farrell, Parliamentary Secretary for Sustainability and Urban Water, states, due to Australia’s obligations in the World Trade Organisation and its free trade agreements, imposing restrictions or conditions on the export of Australian lead “cannot be justified”. (Farrell 2011)

- 2011 June 28 – The LEAD Group asks United Kingdom Prime Minister David Cameron to ban the export of TEL that was destined to be made into leaded petrol. (O'Brien 2011d) As at the date of this chronology, no reply has been received.
- 2011 June 28 – The LEAD Group asks Innospec CEO Patrick Williams to cease the supply of TEL for petrol. (O'Brien 2011e) As at the date of this chronology, no reply has been received.
- 2011 June 28 – The LEAD Group asks Xstrata CEO Ivan Glasenberg to cease the supply of Lead for TEL for petrol (by email and letter). (O'Brien 2011f). On 2 Aug 2011 the letter is returned from Mount Isa QLD with [handwritten] *RTS* on it. The LEAD Group phones Mt Isa Mine and is advised: "anyone who would know the correct address has gone home." A further phonecall to Xstrata's Swiss Zug HQ results in the letter being posted to Switzerland. As at the date of this chronology, no reply has been received.
- 2011 Aug 25 – The LEAD Group sends a formal complaint and a solution involving Innospec within 6 weeks phasing out the sale of TEL for MOGAS, buying back unblended TEL sold for MOGAS, and "Remaining stocks should only be supplied to those OECD and non-OECD countries which have made exemptions under the Rotterdam Convention, to allow the use of TEL in aviation fuel (AvGas) in their country" (O'Brien 2011g) to the OECD NCPs of Switzerland, Australia, US and UK re: non-compliance of Innospec and Xstrata with the OECD Guidelines for MNE (OECD 2011). The US NCP requests a detailed complaint (which was sent Oct 25).
- 2011 Oct 5 to 12 – the PCFV Clearinghouse Secretariat refuses to engage with Innospec, due to their proven bribery of Indonesian and Iraq officials, or invite them to the next PCFV meeting to answer questions on which countries they still supply with TEL for automotive fuel (O'Brien and De Jong 2011).
- 2011 Oct 25 - Paragraph 6 of the OECD MNE Guidelines (OECD 2011) states that an enterprise should "Continually seek to improve corporate environmental performance, at the level of the enterprise and, where appropriate, of its supply chain". Accordingly The LEAD Group asks "That the OECD act urgently to mediate the cessation of supply of TEL for leaded petrol, and failing immediate success with that, that the OECD act urgently to mediate the cessation of supply of lead by Xstrata / BRM to Innospec for TEL for MOGAS, since Innospec is not abiding by the MNE Environmental Guidelines, then Xstrata / BRM is also not abiding by the Guidelines for Multinational Enterprises (MNE)" (Gethin-Damon and O'Brien 2011).
- 2011 Oct 26 & 27 – The LEAD Group presents its strategy to the Global Partnership Meeting of the PCFV in Nairobi and seeks to award Patrick Williams, CEO of Innospec as "Lead-Safe World Champion" for his hoped-for announcement of cessation of sale of petrol lead additive (Gethin-Damon et al 2011). The PCFV Clearing House report on when leaded gasoline will cease being sold in the six remaining countries is full of question marks but includes acceptance that "Innospec expects TEL sales to end 2012". (UNEP 2011) This dead-stop to PCFV progress / action on global phase-out before the end of 2011 creates an opening for others to act.
- 2011 Oct 27 – Associated Press reports in the Washington Post that "[leaded gasoline] is expected to be eradicated globally within two years [in 2013], the United Nations Environment Program announced Thursday [presumably Thu 27 Oct 2011]". (Associated Octel 2011)
- 2011 Nov 17 – "Based on its conclusions that blood lead levels below 10 µg/dL harm children, the [US] Advisory Committee on Childhood Lead Poisoning Prevention (ACCLPP) recommends elimination of the use of the term 'blood lead level of concern.' It recommends the use of a

reference value based on the 97.5th percentile of the NHANES-generated blood lead distribution in children age 1-5 years (currently 5 µg/dL) to identify children with elevated blood lead levels.” (Malone 2011)

2011 Nov 17 – The LEAD Group asks Australian delegate Dr Barry Reville, Branch Head, Environment Protection Branch, Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) and US delegate Dr Ana Corado, Environmental Engineer, Environmental Assistance Division, Office of Pollution Prevention and Toxics, US EPA, who were both attending a SAICM meeting today in Belgrade, Serbia, to take action to inspire Innospec to buy back all stocks of tetra ethyl lead (TEL) used to make leaded petrol, as a way of marking the planned Side Event of the meeting, for planning the International Lead Poisoning Prevention Day of Action. (ICCM 2011)

2011 Nov 24 – The LEAD Group asks US NCP to OECD to ask Innospec *when* in 2012 they are planning to phase out sales of TEL for leaded gasoline for road-use (Yu 2011a).

2011 Nov 30 – Email from the PCFV Clearing House to The LEAD Group states: “UNEP and the PCFV Clearing House have been the major force in eliminating leaded petrol world wide, are actively working on this right now and will not stop until this is completed. Independent evaluations of the EU, US and UNEP have shown that 80+ countries having gone unleaded over the past years is a direct result of the work of the PCFV.” (De Jong 2011)

2011 Dec 1 – Tsai and Hatfield publish peer-reviewed assessment of the global benefits from the phase-out of leaded fuel: best estimate is a global benefit of \$2.45 trillion/year [4.27% of global GDP per year], within a range of \$2.05–\$2.83 trillion, including: child and adult health costs / discounted life earnings for children, \$1.07 trillion/year; global cost for children through IQ decrement, \$1.03 trillion/year; and \$275 billion/year on taxes forgone, ADHD, and leadlinked crime. (Tsai and Hatfield, 2011)

2011 Dec 2 – Despite all of the evidence of the harmful effects of TEL, a UK website exists promoting bottled TEL in a product called TetraBOOST. According to the ‘TetraBOOST’ Website accessed today states:

- “TetraBOOST is genuine tetraethyl lead in a solution of aromatic hydrocarbons, with its associated chemical scrubbers. TetraBOOST enables you to make genuine leaded fuel from the unleaded pump, wherever and whenever you need it” (TetraBOOST 2000-2011a);
- “Malicious rumours have been circulating around the race paddocks and some clubs that TetraBOOST has been banned in Europe and is now illegal!. THIS IS **NONSENSE**. The directors of TetraBOOST would like to make it perfectly clear that no such ban exists, or is in preparation. We intend to continue to manufacture TetraBOOST as usual... “ (TetraBOOST 2000-2011b);
- “Tetraethyl lead waste leaves the exhaust system as tetraethyl lead salts which dissolve harmlessly in the rain” (TetraBOOST 2000-2011c);
- TetraBOOST leaded octane additive containing TEL can be purchased online and delivered throughout Europe and is still being distributed in the United Kingdom Belgium, The Channel Islands, Denmark, France, the Republic of Ireland, Northern Ireland, The Netherlands (Holland) and Sweden (TetraBOOST 2000-2011d);



- “TetraBOOST is now available for a number of [international distributors](#). These include Jersey, the Republic of Ireland, Denmark, France and Australia” (TetraBOOST 2000-2011b);
- “TetraBOOST is the **only** practical way to motor throughout the UK and Europe on leaded fuel - all the way there and all the way back. Indeed, a number of cars in the [Peking to Paris Motor Challenge](#) are running the entire distance on TetraBOOST leaded petrol (TetraBOOST 2010)”
- “We are the future of leaded fuel” (TetraBOOST 2000-2011b)

2011 Dec 2- According to the Innospec (undated) website accessed today despite the IPIECA Position noted above (IPIECA 2003) “...the economies of some countries continue to depend on this product [TEL]. They do not have cars with catalytic converters capable of running on unleaded fuel so TEL remains by far the most cost-effective octane enhancer available.” (Innospec Website accessed 2 Dec 2011).

2011 Dec 15 - US NCP for the OECD, phoned Elizabeth O’Brien to say that Innospec refuses to engage in the OECD mediation process to deal with The LEAD Group’s complaint against them “with obvious reputational risk for Innospec.” Elizabeth replies: “if the OECD or UK or US governments had ordered Innospec to make a non-lead octane additive for gasoline instead of TEL for MOGAS in 1993, every person born since then could have been saved from exposure to lead from petrol ie every child.” (Yu 2011b)

Steps remaining to achieve global leaded petrol phase-out:

- Innospec announces plan for completion of global leaded gasoline phase-out and advises all its TEL-for-MOGAS customers, including non-petroleum refinery customers, of the date of their final supply of TEL
- Innospec stops making TEL for MOGAS
- TetraBOOST stops adding TEL to TetraBOOST in Europe, for blending into petrol at the vehicle fuel-tank – the same applies if there are any other suppliers of TEL-containing products designed for blending with gasoline during automotive refuelling
- Innospec buys back all unblended TEL for MOGAS (for use in AVGAS) and pays for its shipment to countries where leaded AVGAS is permitted for use
- Innospec assists all 6 of the final leaded gasoline countries (and any countries that have ongoing issues of lead contamination from the past use of TEL in MOGAS) to safely dispose of toxic leaded fuel storage tank residues, TEL-contaminated infrastructure as well as lead-contaminated soil and groundwater used for drinking, caused by leaking leaded petrol storage tanks and fuel spills.
- Innospec stops making TEL altogether so that it is not possible for TEL for AVGAS to be diverted as TEL for MOGAS by unscrupulous dealers.

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