THIS WEEK

EDITORIALS

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Wasted energy

The burning off of gas during oil extraction is environmentally unsound and unjustifiable. The United States should instead be seeking to make use of this natural resource.

ne could perhaps forgive the oilmen of the past. In their pursuit of black gold, they simply burnt off the natural gas that was extracted from the rocks alongside their precious oil. It was a time when Earth's bounty seemed to expand without consequence in the face of human ingenuity and technological prowess. The incentive to invest in the infrastructure to capture the gas and bring it to market simply did not exist.

But that is no longer true. There is no justification for the largescale burning off, or flaring, of natural gas by today's oil industry, particularly in the United States, which is home to the most mature and advanced oil and gas industry in the world. Nearly one-third of the raw gas that is pumped out of the Bakken shale formation in North Dakota — a prime target of the new hydrofracturing and horizontal drilling technologies — is burned *in situ*.

True, flaring is preferable to venting gases such as methane, butane and propane directly into the atmosphere, but it still has a detrimental effect on both the global climate and the local air quality. And because companies are exempt from paying taxes or royalties on vented gas for the first year, at least, it is also bad for the public purse. As a result, the public gets a smaller return on the environmental price being paid to recover this oil — the inevitable impacts on public infrastructure, air and water resources, and on the landscape itself.

At a conservative estimate, this North Dakota flaring meant some 3.9 million tonnes of carbon dioxide were emitted last year, the equivalent of the annual emissions from 750,000 vehicles. Worse, research into flaring has begun to find evidence of potentially widespread methane leakage from shale operations, if not outright venting of the gas (see page 290). Methane is a powerful greenhouse gas, so the environmental price is likely to be even higher.

There are solutions. In North Dakota, the state could halt the practice of flaring except when necessary for safety reasons, or it could discourage companies from flaring by making them pay regular taxes and royalties on flared gas. This could delay the development of shale deposits, but that might be a good thing because it would give landowners and government agencies more time to work out how to regulate the environmental and social challenges that accompany energy booms such as shale exploitation. The companies have plenty of motivation to get shale resources out of the ground, and there can be little doubt that they would find ways to exploit the gas currently being flared, perhaps by exporting it. And methane emissions could be better controlled if the US Environmental Protection Agency regulated it as a greenhouse gas and instituted stricter rules across the oil and gas industry.

The US shale boom has been a boon to the struggling economy, providing jobs and government revenue in many far-flung places. The resulting oil production has allowed the United States to reduce foreign imports, and the plentiful shale-gas resources have lowered demand for coal, thereby curbing greenhouse-gas emissions in the power sector. But it will be up to scientists to pin down the full suite of impacts from the new oil and gas developments and to help policy-makers better understand the choices that they are making.

On 15 March, President Barack Obama proposed creating a US\$2-billion Energy Security Trust to advance research and development into low-carbon transport alternatives. It would be funded over a decade by diverting a portion of the proceeds from federal oil

"The public gets a smaller return on the environmental price being paid to recover this oil." and gas development, which are poised to grow thanks to the shale bonanza in North Dakota and beyond. It is a good idea as far as it goes, although once again it is hard not to despair at the general lack of ambition on climate issues in Washington. Improbable as it may be, a federal

carbon tax would raise more money and would send an important signal to the energy industry that it needs to control its greenhousegas emissions.

The US economy is already benefiting from shale developments, and the country might even be able to lock in a one-time emissions reduction as part of a broader shift from coal to cleaner-burning natural gas in the coming years. A logical part of that equation is to kill off the current fashion for flares.

CITES for sore eyes

Successes at last week's wildlife-trade treaty meeting must be backed up with action.

A fter the final votes were cast at the 16th conference of parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) last week, it became clear that something remarkable had happened.

Preliminary decisions earlier in the meeting, which ran from 3 to 14 March in Bangkok, had increased protection for a plethora of species and given cautious hope to zoologists and botanists. The final vote, by representatives of 170 of the states that are signed up to the treaty, rubber-stamped those decisions and sent researchers and conservationists out with broad smiles.

The conference of the parties to CITES deserves praise and recognition for placing a number of species of sharks and rays onto its Appendix II, which regulates trade in animals that are not deemed to be at immediate risk of extinction.

CITES delegates seem to have discovered an overdue and very welcome willingness to step on the toes of influential commercial interests that consistently oppose such restrictions, as they moved to protect marine species of huge commercial importance. They also saw the value in the wood from the trees: several species of tropical hardwoods were added to Appendix II.

Key agreements on trade in elephant ivory were strengthened, to specify the need for campaigns to reduce demand. This is the best — and possibly the only — way to save elephant populations in the long term, say many researchers who study the illegal trade that takes poached ivory from Africa to markets in countries such as China and Thailand.

There are already promising signs that public awareness of the threat to elephants is growing in China, as demonstrated by the campaigning of one of the country's biggest (in more ways than one) celebrities, the basketball star Yao Ming. Similar campaigns against the trade in shark fins — whose status as a delicacy in some Asian countries is often blamed for declines in shark numbers — seem also to be finding a receptive audience.

At the CITES meeting, there was also success for attempts to clamp down on the ivory trade through increased forensic scrutiny of seized ivory and the stockpiles of tusks kept in many African nations. This is a significant victory. Such DNA analysis should provide crucial information on the illegal trade and open up new avenues to combat it (see *Nature* **494**, 411–412; 2013). It is also a validation of the hard work and campaigning put into this problem. The solid evidence base produced by the CITES projects Monitoring the Illegal Killing of Elephants and the Elephant Trade Information System has focused global attention on the resurging crisis of elephant slaughter.

These successes carry important lessons. Popular and scientific reports of the threats to elephants, sharks and other species have helped to tip the political balance in favour of strengthening regulations. Non-governmental organizations deserve credit for raising the alarm, as do politicians for heeding the warnings.

Let us not get carried away. There were also disappointments at CITES — notably the failure to stop trade in polar bears and their parts. Some conservationists also wanted even tougher moves to clamp down on elephant and rhino poaching, including trade sanctions, which were rejected. Overall, however, the post-meeting mood was jubilant — and rightly so.

Serious questions must now be asked about the positive part that CITES can play in future marine conservation. If CITES wants to make progress in this sphere, then it must bring pressure to bear on special-

"Delegates seem to have discovered a willingness to step on the toes of influential commercial interests." ist fisheries-management bodies, many of which have attracted criticism for allowing species such as tuna to be fished beyond sustainable limits. Those bodies have three years to put their houses in order before the next CITES meeting, or CITES will be obliged to do it for them. (The convention does not have a perfect record here, however — it failed in efforts to protect tuna populations in 2010, and dodged the issue at the latest meeting.)

The decisions passed last week will not by themselves save a single animal or plant. Proper monitoring is essential. To build on the successes of the meeting, funders must provide stable financing for continued research on the welfare of those species that now fall under the protection of CITES — and those that do not.

CITES took a great step forward last week. Its success should inspire all those who push for evidence-based policy. Perhaps most importantly, it shows that international meetings that see the with dissonant agendas and actors are not always toothless talking shops.

A pope for today

Latest pontiff looks to enhance social relevance of Catholic Church.

Whether or not you are a believer, it is hard not to like the man. In the few days since the white smoke began to billow from the Sistine Chapel in Vatican City, the world has learned a little about Jorge Mario Bergoglio, the 76-year-old elected as Pope Francis I. The first pope from Latin America, as archbishop of Buenos Aires he eschewed the trappings of the office, forgoing a mansion for a small apartment, preferring to take the bus than use a chauffeur, and dedicating himself to pastoral work in the slums. The affable Pope Francis has also already wooed the public (and much of a fawning media) with his disarming humility and common touch — and his obvious flair for ad-libbing and humour. It is clear that Francis's papacy marks a break with the past, a new distinctive and refreshing papal style, and an ambition to focus on social relevance and justice. "How I would like a Church which is poor and for the poor!" he said.

We also learnt that the man obtained his first degree in chemistry, a later one in philosophy and another in theology, and that he has taught literature and psychology at universities. That broad education, academic bent and humility are hardly a surprise because Bergoglio is the first Jesuit pope. The Jesuits, the largest order in the Catholic Church, are its intellectual elite and known for their independent thinking. They also vow to live lives of austerity and never to seek high office in the Church — let alone pope. They have focused on issues of social and economic injustice, and less on doctrine than do career clergy. They have long worked as missionaries, and are probably best known for their creation and running of some of the world's top schools and universities. Many are also scientists.

We know little about Bergoglio's views on scientific issues, which he has hardly written about. The hordes of scientists among the Church's 1.2 billion baptized members would like to hear more. And his chemistry degree in itself says little about the Pope's attitudes to science. But what is clear is that, contrary to widespread belief, the modern Catholic Church is science-friendly and Pope Francis will no doubt continue, and perhaps deepen, that tradition. The Church's strong support for Darwinian evolution, for example, contrasts sharply with the backwards unscientific belief in creationism of many US evangelicals and lawmakers — a concept that Pope Benedict XVI rightly criticized in 2007 as "absurd". Priests also gave us Mendelian genetics and contributed to the theory of the Big Bang.

Moreover, recent popes have substantially increased efforts to engage in dialogue with scientists on a host of issues, from embryonic stemcell research and genetically modified crops to *in vitro* fertilization, abortion and euthanasia — and in the future will no doubt increasingly do so on advances in neuroscience and genetics, including prenatal screening. Scientists who have taken part in such discussions tell of thought-provoking and constructive debates, with the Church being open to ideas and often changing doctrines as a result. A damaging exception is its long-held opposition to the use of condoms to prevent the spread of HIV, and it can only be hoped that Pope Francis will have a more enlightened approach.

But whereas doctrines can be tweaked, the Church will not compromise on its central dogmas, such as the sanctity of human life and that life begins at conception. Science and faith can provide complementary world views, with progress in science informing and often challenging the rationale of Church doctrines, and vice versa: faith can often add much-needed dimensions of ethics and social justice to advances in science and their impact on society. Clashes are inevitable between peo-

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To comment online, click on Editorials at: go.nature.com/xhunqv ple of different beliefs, but both science and religion are best served by building bridges across the divides. How Pope Francis responds to issues where the two meet will be an important mark of the man.