DOMESTIC WATER ISSUES

Water is a fundamental part of human and natural life and it is 'consumed' through a variety of sources within the home, garden, agriculture and industry. The way in which water consumption is managed both on domestic and industrial level has a direct effect upon the environment.

Water is a limited resource, yet it is not a 'valued' commodity in the developed world and therefore there are no real concerns about wasting it.

The UK has seen a 50% rise in household water consumption since 1970 (Defra www.defra.gov.uk/environment/statistics/eiyp/index.htm). The increasing demand has been due mainly to social changes, for example more small occupancy households (see graph on inside page of report) and rising affluent lifestyles (greater use of dishwashers etc.).

In the UK, consumption is often highly wasteful. Internalisation of environmental costs has apparently had little success in the water sector, such that the price of water does not give the signal that it is a precious resource. Figures from Water UK show that in 2000 the average person in the UK uses around 147.4 litres per day (NB: average American uses approximately 530-600 litres of water per day - www.Getwise.org) reflecting the fact that incentives for society to consume more wisely are not apparent, particularly with no universal metering in the UK for domestic customers.

In the UK the water industry provides 18,000 million litres of water every day to 58 million people – that's enough to provide everyone on earth with twice the recommended intake.
Water UK

Climate change is an important issue facing water resources management over the next century, it is expected that there will be more extreme patterns in the weather systems, for example hotter/drier summers (less water available when most needed). It is therefore expected that this will not only affect water availability but also demand. The effects of new housing development (4 million in south east by 2025) and climate change will undoubtedly exert increasing pressure both on the UK Government and water companies to ensure that water remains a sustainable resource.

In Agenda 21, domestic consumption was identified as a significant area of water use and it was recommended that all governments should:

- Promote schemes of rational water use through public awareness raising, education programmes and levying of water tariffs and other economic instruments;
- Promote water conservation through improved water-use efficiency and wastage minimisation schemes for all users;
- Give special attention to the growing effects of urbanisation on water demands, usage and to the critical role played by local and municipal authorities in managing the supply, use and overall treatment of water.' (Chap 18).

Running the tap can use 10–14 litres of water a minute – which would give enough for a small bath in just 5 minutes. (Source: Environment Agency – Water Wise)

Sustainable water production and consumption was defined in an initial workshop as:

'Responsible supply and use of water now and in the future which is consistent with available resources so as to achieve good health, hygiene and maintenance of environmental quality. Recognising the true value, costs and impacts of water supply treatment and after treatment.'

Environment Agency definition

'Water is a renewable resource so sustainable production and consumption is about keeping its use within the limits of its replenishment. (For example, stable groundwater levels).'

The Environment Agency's vision for water resources for the next 25 years is:

Abstraction of water that is environmentally and economically sustainable, providing the right amount of water for people, agriculture, commerce and industry, and improved water related environment.

The following actions for water sustainability were agreed during an initial workshop:

1. No systematic build up of synthetic materials in the natural environment
2. No systematic build up of natural materials in the natural environment
3. Ecosystems to remain stable – maintain integrity
4. Fair and equitable use of resources for all

KEY ISSUES CONSIDERED:

1. INTERNATIONAL CONFERENCE ON FRESHWATER

W1. RECOMMENDATION

The UK Government should actively promote and adopt the recommendations of the Bonn accord.

The International Freshwater conference was held in Bonn in December 2001 and concluded with 26 recommendations for action to be agreed upon at the World Summit on Sustainable Development. The conference recommended priority actions under the headings of governance, mobilising financial resources and capacity building and sharing knowledge. Further information on the individual recommendations can be found at:

http://www.water-2001.de/outcome/BonnRecommendations/Bonn_Recommendations.pdf

The conference was attended by ministerial delegations from 118 countries as well as the World Bank, UN organisations and many other leading environmental groups. The multi-stakeholder process attached to the conference had a large influence over the outcome, particularly the presence of civil society groups in securing that water is a public responsibility and should not be left solely in the hands of a privatised industry and that governments have an obligation to ensure public access to a lifeline supply. The civil society representation and concerns were taken into consideration by water policy experts and decision makers, in an agenda which was not determined by corporate water sector interests.

Please view http://www.water-2001.de/ for further information on the International Water Conference. The detailed report can be found at: www.water-001.de/outcome/reports/Brief_report_en.pdf

2. SUSTAINABLE WATER & EDUCATION

W2. RECOMMENDATION

Education should be provided for all on domestic and global water consumption and production, specifically for target audiences in drought areas.

Education for children was seen as key in changing the behaviour in consumption of domestic water. Although there are pressures exerted on teachers by the current National Curriculum, water is "energetically inserted into it wherever possible" (Water Companies Education Forum). There are a number of good programmes that educate, mainly primary school children, on conservation issues and can incorporate elements of the National Curriculum, for example WaterAid's "Water in the School" which has been developed in association with a number water companies.
www.wateraid.org.uk/education/index.html

The statutory duty placed on water companies to promote water efficiency has resulted in their involvement in awareness and educational projects. This, in the majority, exists via several programmes, particularly corporate web pages (Thames Water Wise - www.thames-water.com/waterwise/) but also includes some innovative ideas such as Southern Water's Drips play and Environmental Education Centres (Severn Trent – www.severntrent.co.uk)

However, although some interaction with children is evident it was emphasised by the working group that there should be consistency in education campaigns on water and that it should also be presented with greater originality, with particular attention to areas of water stress. Innovative ways should be found, such as using interactive game technology or sports/TV stars to inform, make aware and educate.

Example of educating children – Southern Water Drips in School

An award winning play called Drips, performed by the Facepack Theatre Company, entertains pupils in schools on water conservation The play involves two children, Danny and Daisy who know a lot about water conservation, a Granny who is very wasteful with water but she is taught a lesson. Mum and Dad Drip offer advice and Uncle Clive who knows what living without enough water is like - he's lived in hot places all over the world.
Southern Water's Water Efficiency Manager, Magda Styles, said: "The Drips family is one of our best ways of promoting the water efficiency message to young people and they of course in turn influence their parents."
Source Southern Water website – www.southernwater.co.uk

Computer Game Education

The Hydroexplorer range of US computer games enables children to learn about water pollution, conservation and general water issues. The Hydroexplorer Comes to Your Home game uses both graphics and audio to help children guide a mini-submarine from a cloud through the water distribution system and treatment plant and into a consumer's home. As they guide the sub they learn how to make wise water use choices by learning about water saving versus water wasting activities.
Water Education Foundation http://www.water-ed.org

3. USAGE AWARENESS

W3. RECOMMENDATION

A mechanism is required for relating public water usage to cost. Although there was no consensus on how this can be achieved, it was agreed that individuals needed to be motivated to save water.

Water is seen as a right. The need to highlight the responsibilities that accompany this right is necessary. Public perception is viewed as one of the major barriers to effective water conservation and recycling projects (DeSena, 1999)[4]. This could be due to three factors:

- low perceived value of water given its abundance
- lack of information
- general apathy of consumers and unwillingness to change behaviour

The simple awareness campaign highlighting the waste of water when 'leaving the tap running whilst brushing your teeth' in the 1970's was considerably effective. It was intended to be the catalyst for other water saving techniques in the home but unfortunately this did not happen. It appears the best way to encourage reduction in water consumption is by increasing the price and thus giving water a greater perceived value.

3.1 METERING WATER SUPPLIES

Several studies have demonstrated that rising water prices have a positive effect on both indoor and outdoor water conservation efforts (use of low-flow toilets, taps and shower-heads for example) (see Agthe, D.E. and R.B. Billings, 1996 and Russac et al., 1991)[5,6]. A report by the European Environment Agency in 2001 stated that immediate savings in household demand of between 10-25% could be achieved by the introduction of household water metering.

http://reports.eea.eu.int/Environmental_Issues_No_19/en/Environmental_Issues_No_19.pdf

Domestic metering is widespread in many countries (e.g. France, Germany and Portugal), but less common in the UK. Approximately 15% of UK households are now metered (Butler, D. & Davies, 2000)[7] and data from UK Water shows that metering has increased the awareness about consumption and ultimately reduced the average household bill.

Average household bills 1999/2000 (£)

Unmetered:	water	121
	sewerage	157
TOTAL		**277**
Metered	water	101
Water mains (km)	sewerage	126
TOTAL		**225**

Source: Water UK

For the UK to adopt a pricing mechanism to reduce demand, the socio-economic impacts need to be thoroughly assessed, as it is imperative to guarantee equity throughout the pricing structure. Differential tariffs should be employed to guarantee this. For example an initial tariff would be appropriate to cover the minimum personal needs with a secondary tariff at a higher cost for additional uses.

Under Severn Trent Water's current policy, metering is voluntary for domestic consumers (compulsory for new housing and for households with sprinklers) but only 10 per cent of them have so far opted for this change. The great majority of those who have made the change have done so to reduce their bills from a high rateable value based charge to a much lower charge by volume. But even though they then pay the cost of each litre they use, their total bills are usually so much lower than previously that they do not feel a strong incentive to economise.

Source: Severn Trent Website

A large number of water companies offer their customers the option of fitting a meter, which is either for an initial fee or possibly free. Unfortunately the lack of awareness of this option and the perception that costs may rise with a metered water supply restricts the take-up of a voluntary system.

[4]DeSena, M. (1999) Public opposition sidelines indirect potable reuse projects. Water Environment & Technology. May 1999. [5]Agthe, D.E. and Billings, R.B. (1996) Water price effect on residential and apartment low flow fixtures, Journal of water resources planning and management. January/February. [6]Russac, D.A.V. , Rushton, K.R. & Simpson, R.J. (1991) Insights into domestic demand from a metering trial, J.IWEM, 5, 3, 342-351. [7]Butler, D. & Davies, J.W. (2000) Urban Drainage, E & FN Spon, London

The effects of water metering in Germany

Between 1990 and 1995 water consumption per person declined by 9% in the whole of Germany. Average daily water consumption currently amounts to 132 litres per person, the same level as twenty years ago. The drop in water consumption is not only because of the changes in water prices but also because of changes in consumer behaviour.

Mr. Meacher (answering for Margaret Beckett):

"The Government promote water efficiency by a variety of means including through the Environment Agency's National Water Demand Management Centre, the Water Fittings Regulations, Envirowise (business), the Market Transformation programme, the Buying Agency's Watermark project (public sector – greening govt), leakage targets for water companies, maintenance of a database of water efficiency research, and through on-going discussions with Ofwat, the Environment Agency and the water industry"

Very little to suggest the government is ensuring quality information and advice to domestic consumers.

PRACTICAL ACTION

Compulsory metering is essential to promote water conservation. Differential tariffs should be introduced to ensure that sufficient water, ensuring social/health safeguards, is available at affordable prices for all domestic households. Once use exceeds this basic level, progressively higher charges should be introduced to discourage waste.

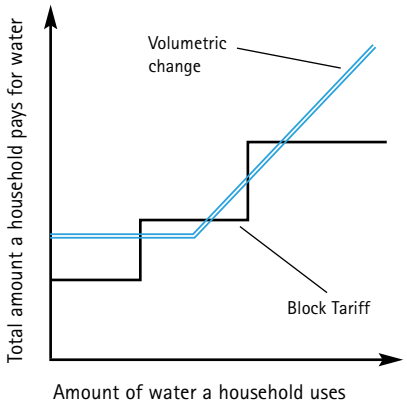
3.2 BLOCK TARIFF

Another approach that was discussed within the workshops consists of action to regulate supply by introducing "block tariffs" to discourage a high use of water. This referred particularly to business and industry where tariffs decrease with increasing consumption but as this is not relevant to the 'domestic' situation, it will not be discussed in detail in this report.

Metering Domestic Water Consumption – Two Viable Options

- A tariff structure that combines a standing charge with a volumetric charge that only starts to apply above a given level of 'basic' water usage.

- A block tariff structure, where the amount paid still depends on the volume of water used but does not vary continuously with it.



Developed from: Fair And Sustainable: Paying For Water. What the Government Could Do, New Policy Institute, 1997.

4. CLIMATE CHANGE

W4. RECOMMENDATION

The link between energy conservation and water should be emphasised in public education and awareness programmes as the climate change message is more widely spread than the need for water conservation.

A single washing machine cycle uses up to 100 litres of water (22 gallons) - and the average family uses its washing machine five times a week. That is 26,000 litres (5,720 gallons) in a year. (Source: Southern Water website)

The impacts upon the environment through energy use are large. By following the simple steps to cut down energy within the home a corresponding reduction will be seen on water.

Climate change is undoubtedly at the top of the list of priorities for sustainable development. Public perception is growing, society is demanding better products – more efficient cars, white goods etc - and behaviour is slowly changing. On the other hand the link between water conservation and climate change has not yet been realised. Energy usage in producing and consuming water is vast, through water purification, sewage treatment, transportation and domestic water heating. Figures from the Severn Trent Stewardship report illustrated that Severn Trent Water CO_2 equivalent emissions for 2001 were 118,658 tonnes and in the home 15% to 25% of an average family's energy bill is used in heating water (Consumer Research Magazine)[8]. If less water is used then correspondingly less

[8]Hot Water Energy Conservation: Heating Water Accounts for 15% to 25% of an Average Family's Energy Budget," Consumers Research Magazine, p. 19, January 1991.

energy is consumed and hence there is less overall impact on the environment.

Strive not to drive! It takes approximately 6 gallons (23 litres) of water to produce one gallon (3.8 litres) of gasoline.
Source: www.getwise.org

The challenge is to address the lost link between water consumption and climate change. This could begin by explaining the issues to consumers through action by the key players both within government and the water industry.

It is in the best interests of the water industry to focus on energy efficiency and water conservation to avoid the problems that will surely arise for the industry through the impacts of climate change, especially droughts in summer and flooding sewers in winter.

Although research and development are key components in solving the problems it is essential that consumers are informed of the behavioural changes that can make a difference.

- Install low-flow showerheads and faucets or flow restrictors. Try to reduce your hot water use in other ways, too. Savings: 10-16% of water heating costs.
- Take showers instead of baths, and shorten your shower time. Baths call for 4.5 times as much hot water as showers. Cutting your shower in half will reduce water heating costs by 33%.

Source: City of Davis California website www.city.davis.ca.us

5. WATER EFFICIENCY AWARDS

W5. RECOMMENDATION

Water Efficiency awards should be promoted more widely – for example using high profile public buildings as case studies.

For more information on the Water Efficiency Awards please visit the following sites: www.environment-agency.gov.uk/subjects/waterres/286587/286599/198853/?lang=_e&tregion= and www.water.org.uk/index.php?raw=353
The Water Efficiency Awards is a joint awards project funded and managed by the Environment Agency and Water UK. Entrants are encouraged to submit water efficient projects and practices that have produced substantial savings in both costs and water. There are a number of award categories, for example water companies, industry, agriculture, and public sector. Winners from each category are promoted via leaflets as case studies and principally benchmarks for others in similar situations.

Although the awards have only been in place for 2 years it was agreed that there is a need for them to have a greater 'promotion', both in terms of the event and the winners. It is important that the prestige of the competition is seen by civil society in order to promote water conservation as an essential component of sustainable development that business is taking extremely seriously.

PRACTICAL ACTION

Future water efficiency awards should have greater media attention, this can be achieved by high level corporate sponsorship or partnership, which may include an organisation such as the BBC.

6. WATER SAVING TRUST

W6. RECOMMENDATION

The UK Government should consider the development of a 'Water Saving Trust'.

A 'Water Saving Trust' should be developed using revenue from higher tariffs to continue awareness of water efficiency and provide funds for new technologies, particularly in conservation techniques where there are few drivers for research. The ecolabel schemes, customer demand and the 1999 Water Supply Regulations are the only real drivers for manufacturers to develop more efficient products. However, in reality, ecolabels and the marketing of efficient products have not been particularly successful to date. A 'Water Saving Trust' directing funding specifically into water conservation programmes is likely to yield better results, at least initially.

The higher tariffs funding the Trust will only generate surplus revenue if they do not work, meaning that people's water use remains unchanged. However, if the tariffs do indeed work, and water use is significantly reduced, no surplus will be generated and hence in later stages other more 'sustainable' ways of generating revenue could come from either:

- A fixed levy on the bill (as with electricity)
- Increased water abstraction charges paid to the Environment Agency.

In the long term the Trust could be used to finance the apparently uneconomic retrofitting of water efficient devices in the existing housing stock and provide advice to the current occupants.

7. WATER INDUSTRY

W7. RECOMMENDATION

The UK Government should review the water industry structure, as political barriers are seen as the most difficult obstacle to overcome.

The water industry currently has three regulators, OFWAT, Environment Agency and Drinking Water Inspectorate.

- OFWAT: 'responsible for making sure that the water and sewerage companies in England and Wales give you a good-quality, efficient service at a fair price' (www.OFWAT.gov.uk)
- Environment Agency: ensuring and improving the quality of rivers, estuaries and coastal waters
- Drinking Water Inspectorate: oversees the quality of tap water

Having three regulators and privatised water companies is questionable as there is potential for confrontation, specifically regarding sustainable development. Each organisation has its own 'agenda' and OFWAT specifically has been criticised for not taking into account the environment in its decision making - see Environmental Audit Committee's seventh report, Water Prices and the Environment.

www.parliament.the-stationery-office.co.uk/pa/cm199900/cmselect/cmenvaud/597/59702.htm

Water conservation can only be truly successful with community participation. The fact that water companies are becoming fewer, larger, and more remote from the consumers they supply, and are driven by the profit motive, is perceived as working strongly against public participation. It is therefore important for water companies to maintain close relations with all their stakeholders, specifically as they currently pride themselves on their regional identity and involvement.

7.1 INCENTIVES FOR WATER COMPANIES

A funding system should be established to provide incentives for water companies to establish conservation programmes with their consumers, e.g. water efficiency and good water resource management.

There are a number of barriers for water companies to promote conservation, for example the trade off between conservation and dividends to shareholders and the need to drive down costs. Water companies have a statutory duty to promote the efficient use of water by their customers and their actions have to be reported to the Director General of Water Services, as well as being monitored by OFWAT. Some companies are actively raising awareness through programmes specifically aimed at children (e.g. Thames Water's 'Wise Water Home' - www.thames-water.com/waterwise/homes/tour.html), through efficiency advisors and community talks. However, there is still a need to encourage the water companies to promote conservation of water with greater effect.

The introduction of a funding regime could be linked to achievement of targets and a percentage refund of corporation tax with revenue generated being ring-fenced and redistributed for further water efficiency activities. This would encourage those companies which perform well to invest further in new and innovative water efficiency measures (e.g. reducing the costs of water butts, water recycling programmes in the home, promoting water efficient goods, providing a free home water audit).

8. BUILDING REGULATIONS

W8. RECOMMENDATION

There should be a tightening of building regulations for water. Precautionary action on water and climate change should be incorporated into water planning.

Current building regulations do not encourage architects and house-builders to design and build houses with water conservation and low water consumption as high priorities. Influencing sustainable construction and efficiency in both water and energy is not easy but it is essential to encourage greater sustainability in building designs.

This can be achieved initially by influencing professionals within the building industry on efficient water management in order that standards, specifications and better designs can be incorporated into mainstream buildings – and not simply showcase projects. Incorporating more sustainable strategies is a major challenge because of the competition between house prices and overall building costs, particularly when bidding for site development. It is unlikely that the current public perception of water conservation will provide a sufficient incentive for change and therefore other mechanisms are needed, including a tightening of building regulations and fiscal measures.

8.1 CHANGE PLANNING POLICY GUIDELINES FOR ALL NEW BUILDINGS

W9. RECOMMENDATION

Local planning departments should have increased powers to introduce water efficiency specifications in new buildings. These should be based on the regional degree of water stress but should introduce good practice throughout the country.

Water consumption targets should be introduced with specific benchmarks for new buildings, linked to regional water availability. Other methods such as recycling of water, limitations on water use by introducing conservation technologies in new buildings (e.g. press taps, dual supply water, grey water re-use and the phasing out of old and inefficient equipment) should also be encouraged. The development targets would mean that local authorities would need to be given the powers to make meeting a low water use specification a condition of planning approval. However, as local authorities are not experts in this area other bodies should be involved in drawing up standards, e.g. Building Research Establishment, Construction Industry Research and Information Association, Water UK, Environment Agency, or central government.

"Making planning consent dependent upon introducing water efficient fittings is a long overdue step." Workshop delegate

Under the new regulations, inefficient water fittings would no longer be permitted. The Market Transformation Programme (MTP) should also play a part, which has recently been extended to water-using appliances, with the intention of improving their efficiency (www.mtprog.com).

9. DRINKING WATER

W10. RECOMMENDATION

The sustainability of drinking water, both mains and bottled, should be thoroughly reviewed.

One issue which was raised at the initial workshop in 2001 but not covered in depth during the 2002 workshop is that of drinking water and Bottled Water in particular.

The growth of the bottled water industry

The growth of the bottled water market has been extraordinary over the last ten years. The overall industry is worth €37billion, with world consumption growing by 9 per cent over the last three years (Danone 2001 Annual report). In the US alone over 17 billion litres of bottled water in 1999 were consumed at a cost of nearly $5 billion (www.pacinst.org/water_facts.htm). In the 'active thirst market' (drinks people reach for when they are hot and thirsty) bottled water has a 25% share compared with tap water at 37% (Wall Street Journal Europe June 12, 2002). The growth in bottled water has led to unprecedented moves from the major soft drinks market to increase their share of this growth.

In the UK, bottled water had an overall retail value of £600 million in 2000, which is a 16 per cent increase on 1999 figures. www.thinkpackaging.com/index.mv?content=features

The changes in consumption for soft drinks in the UK are given in the table below. They show that bottled water has increased from a 5 per cent share to 12 per cent in 2000, however its share of growth is second behind carbonates with 30%.

UK SOFT DRINKS SHARE

Soft Drinks	1990 Consumption	2000 Consumption	Share of Growth
Carbonates	52%	50%	45%
Dilutables	30%	24%	7%
Fruit Juices	9%	8%	6%
Fruit Drinks	4%	6%	12%
Bottled Water	5%	12%	30%

Source: Zenith International – in Sucralose Soft Drinks Reports

In the US consumers are spending 240 to 10,000 times more per gallon for bottled water than they do for tap water. (Carol Potera, "The Price of Bottled Water," Environmental Health Perspectives Volume 110, Number 2, February 2002.)

The average French citizen consumes 150-250 litres of mains water per day, of which only 2 litres are drunk. Thus less than 0.5% of water treated to drinking quality is actually drunk. (UNEP and Natural History Museum, London.)

Water in Schools is Cool Campaign – Aims to improve children's access to fresh drinking water.

"Make it clear to schools that you take the provision and state of drinking water facilities and toilets seriously: that you consider the welfare of your child to be at least as important as the academic side of the school."

Source and information: www.wateriscoolinschools.co.uk

DOMESTIC WATER ISSUES

In the UK all domestic mains tap water is purified to drinking water standards and yet the market for bottled water is increasing, partly because of consumer 'fears' about the purity of tap water, partly because of convenience for a highly mobile population and partly, perhaps mainly, because of the marketing efforts of the bottled water companies. This market clearly has considerable environmental impacts from the production, packaging and transportation.

Aside from the 'direct' environmental issues, it clearly does not make sense to purify water to drinking standard and then consign most of it to the sewage system. And yet if it was decided to 'down-grade' the purity of mains water and then supply drinking water at the point of consumption either by 'in-line' water purifiers or as bottled water (delivered to the door or purchased with other food and drink), there is no guarantee that some water from mains taps would not be drunk and/or used for teeth cleaning etc. with obvious health implications. It is therefore widely believed that given the current infrastructure, it would not be possible to change the production and distribution of mains water, at least for existing housing.

The question for UK civil society therefore is whether or not, given that mains drinking water is available to every domestic property in the UK, Bottled Water should be actively promoted as it is. Should public awareness be raised on the issues and the trend reversed in favour of mains drinking water? If so how?

The Government together with Water Utilities, Water UK and other stakeholders should review the current infrastructure and production/supply of mains drinking water. If it is considered inappropriate to 'downgrade' the quality of tap water and where existing sources of mains water are considered perfectly acceptable for drinking purposes (which we assume to be most if not all) active measures should be taken to promote the 'virtues' of tap water, emphasising the environmental benefits that would result. Consideration should also be given to 'internalising' the full environmental costs of bottled water, through a variety of fiscal measures, thereby further favouring tap water.

PRACTICAL ACTION

Practical Action – expand the latest initiative by Yorkshire Water called "Cool Schools" to introduce chilled water dispensers into schools – this has been done not for environmental/sustainability reasons as such but to make drinking water more readily available given the link between dehydration and reduced learning capability

PRACTICAL ACTION

A comedy advertising campaign with a bottle that simply says "Tap Water!" using images of refreshing mountain streams and associating the product with stylish living has enabled distributors of bottled water to create a market worth more than £600m at retail level. Stylish graphics and photographs of 'pure' mountain springs and snowy mountains paint a compelling picture.