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cutting through complexity

The KPMG Green Tax Index 2013

An exploration of green tax incentives and penalties

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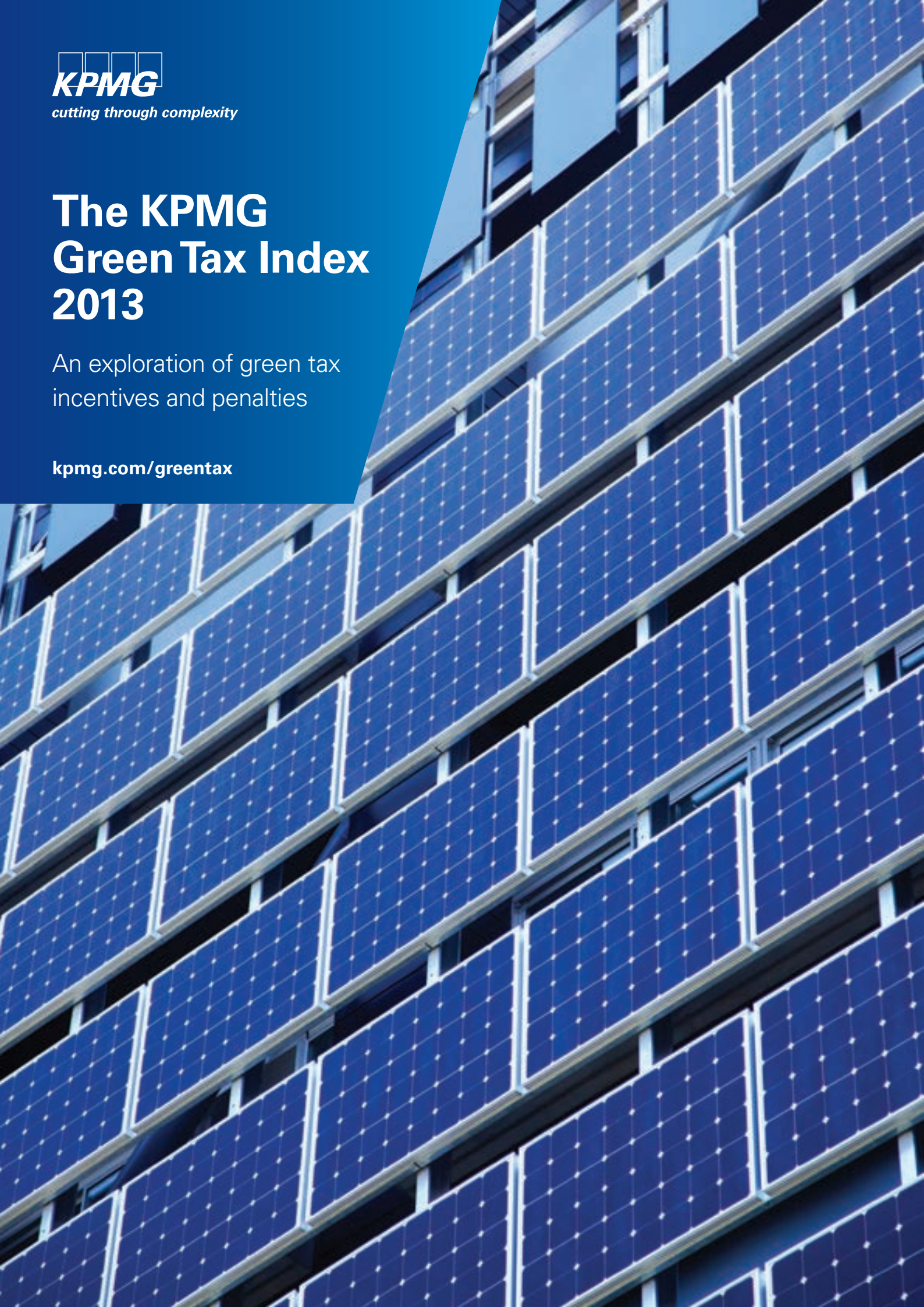

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Introduction:
the growth of tax as a green policy tool

Green tax is big news

In September 2012, *The Japan Times* reported that the Japanese government is to introduce a new tax to curb carbon emissions. It is expected to generate revenue of 262 billion Japanese yen (JPY) (USD2.7 billion) from fiscal year 2016.[1]

Also in 2012, China announced increases in resource taxes on six minerals, including iron and tin ore. Reports attributed the increases to China's policy objective of conserving domestic mineral resources and the environment.[2]

In February 2013, the US Department of Energy announced USD150 million in Advanced Energy Manufacturing Tax Credits for clean energy and energy efficiency manufacturing projects across the US.[3]

These are just three recent examples of how governments worldwide are using tax as a tool to address the challenges of social and environmental change.

The global population continues to rise. Billions more people have access to higher-consumption lifestyles. Global food and water supplies are under increasing pressure. Energy supplies are, for many, increasingly insecure and prices more volatile. Material resources are becoming less easily available and competition for them is increasing. Ecosystems are declining, forests are disappearing and the climate is warming.

Governments, in response, are attempting to lower carbon emissions; reduce, reuse and recycle waste; encourage efficient use of water, energy and material resources; and promote green innovation.

They cannot achieve these policy objectives without changing business and consumer behavior; corporations contribute to the challenges and can therefore play a key role in addressing them.

As governments increasingly use tax as a tool to achieve green policy goals and make corporate behavior more sustainable, the global green tax landscape, in the form of both incentives and penalties, is evolving rapidly and becoming more complex.

KPMG International has analyzed 21 countries for this report and found that all of them have green tax systems that warrant attention from corporate tax and sustainability teams. The research identified over 200 individual tax incentives and penalties of relevance to corporate sustainability. At least 30 of these have been introduced since January 2011.

There is evidence to suggest that not all corporate tax teams are fully aware of the landscape of green tax in which they operate and the incentives that may be on offer. For example, in March 2012, Bloomberg BNA surveyed tax accountants and tax lawyers in the US to gauge knowledge and awareness of tax incentives for clean energy.[4] Two-thirds of those interviewed were unaware of how US clean energy tax credits work.

This is a concern. As environmental and social challenges gather pace, future business value depends on carving competitive advantage out of complex and unpredictable risks. In most sectors it requires transformational change.

The investments that can drive this change and secure competitive advantage may never be made if green tax systems are not fully understood and used. Investments that struggle to make a case on a pre-tax basis, can flourish after green tax analysis. Business leaders should not underestimate the potential of green tax incentives to deliver efficiency and productivity benefits, drive innovation and contribute to the bottom line.

The KPMG Green Tax Index aims to raise awareness of the rapidly evolving global green tax landscape and to encourage chief financial officers, tax directors and chief sustainability officers to work together in navigating it. Collaboration between the tax, finance and sustainability functions is important to ensure that business takes the right decisions to create future value in a resource constrained world.

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[1] http://www.japantimes.co.jp/news/2012/09/29/business/green-tax-to-come-into-force-in-october/. Accessed 14 April 2013.
[2] http://www.bloomberg.com/news/2012-02-17/china-raises-resources-tax-on-iron-tin-molybdenum-production.html. Accessed 14 April 2013.
[3] http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=837. Accessed 14 April 2013.
[4] http://www.bna.com/tax-professionals-unfamiliar-pr12884908294/. Accessed 19 March 2013.

About the **KPMG Green Tax Index**

"A high ranking in the Index means that the government is more active than others in using its tax system to drive sustainable business and achieve green policy objectives."

KPMG has created the KPMG Green Tax Index to increase awareness of the complex, fragmented and rapidly evolving green tax landscape worldwide. It aims to encourage companies to explore the opportunities of green tax incentives, and to reduce exposure to green tax penalties.

A high ranking in the Index means that the government is more active than others in using its tax system to drive sustainable business and achieve green policy objectives. It does not necessarily mean that a country is 'greener' than others.

Every country listed on the Index has a green tax system that deserves attention. Countries without any green tax incentives or penalties are not included in the sample of 21 countries reviewed here.

Companies that operate or plan to operate in these markets, particularly in the countries that rank higher in the Index, are advised to familiarize themselves fully with the details of those countries' green tax systems and to include after-tax effects in their investment modeling calculations.

Consideration of after-tax effects can also help a company avoid paying unnecessary penalties, which in itself can provide additional funding and capital for investments.

The KPMG Green Tax Index, as well as providing a guidepost to businesses, offers an overview of the green tax landscape around the world and a broad summary of what governments are putting in place. For this reason, it may also be useful to governments, particularly those in the early stages of formulating green tax policies.

Note: The data in this report was compiled as of 23 April 2013.

Methodology

The KPMG Green Tax Index focuses on 21 major economies around the world that KPMG believes represent a major share of global corporate investment activity:

Argentina	France	Russia
Australia	Germany	Singapore
Belgium	India	South Africa
Brazil	Ireland	South Korea
Canada	Japan	Spain
China	Mexico	UK
Finland	Netherlands	US

KPMG member firms have analyzed the tax systems in these countries to determine the number and range of incentives and penalties that influence corporate activity in relation to nine green policy areas:

- Energy efficiency
- Carbon & climate change
- Green innovation
- Renewable energy & fuels
- Green buildings
- Green vehicles
- Water efficiency
- Material resource efficiency & waste management
- Pollution control & ecosystem protection.

Some tax penalties and incentives apply to more than one of the policy areas above. Discretion has been used to decide which section of this report they are covered in. Scores should be taken as indicative, not absolute, in providing a view of governments that are most active in using tax as a green policy tool.

The following principles were used to create this Index.

- Points have been awarded or deducted to reflect: the ease or complexity of the incentive claim process; long or short-term availability of incentives; and the flexibility to transfer or carry forward tax benefits.
- Tax penalties score highest because companies cannot avoid complying with penalty legislation.
- Tax credits score higher than deductions and capital allowances. Arguably tax credits are worth more to taxpayers and also cost a government more (as a direct and permanent reduction in tax revenue).
- Penalties or incentives designed for small businesses, households or private individuals are not included.
- Scoring is limited to instruments that are part of a country's tax code, i.e. tax penalties, credits, deductions, enhanced allowances, accelerated depreciation and indirect tax benefits. Many governments use other incentives such as grants, subsidies and soft loans to influence corporate behavior. The Index highlights notable examples where appropriate, but does not score them individually due to the high number and fluidity of these programs.
- Scoring is limited to national tax codes although noteworthy examples of sub-national tax penalties and incentives are given in the accompanying narrative.

Scores have been attributed to tax penalties and incentives according to arguable value and potential to influence behavior, as follows:

Tax/incentive type	Points
Carbon tax	4
Tax credits: green specific	3
R&D tax credits: green specific	3
Tax penalties with direct green application (other than carbon taxes)	2
National/international carbon cap-and-trade system	2
Capital allowances/accelerated depreciation/deductions: green specific	2
R&D tax deductions/accelerated depreciation: green specific	2
General R&D tax incentives: not green specific but for which green innovation projects are eligible	1
Indirect tax incentives, e.g. value-added tax, excise taxes, customs duty	1
Other green specific tax benefits with limited application (e.g. limited flexibility or short-term application)	1
Sub-national carbon cap-and-trade system	0.5
Existence of sub-national incentives in any category	0.5

Source: The KPMG Green Tax Index, 2013.

The Index:
country rankings

OVERALL RANKING	
US	1
Japan	2
UK	3
France	4
South Korea	5
China	6
Ireland	7
Netherlands	8
Belgium	9
India	10
Spain	11
Canada	
South Africa	13
Singapore	14
Finland	15
Germany	
Australia	17
Brazil	18
Argentina	19
Mexico	20
Russia	21

TAX INCENTIVES ONLY	
US	1
South Korea	2
China	3
India	4
UK	5
Canada	6
Netherlands	
Japan	8
Ireland	9
Belgium	10
Singapore	11
Brazil	12
South Africa	
Argentina	14
Spain	15
France	16
Germany	17
Mexico	18
Australia	19
Russia	20
Finland	21

TAX PENALTIES ONLY	
France	1
Japan	2
UK	3
Finland	4
China	5
Ireland	6
Spain	
Australia	
Netherlands	9
South Korea	
South Africa	
Belgium	
Germany	
US	14
Singapore	15
Canada	16
Russia	17
India	
Argentina	19
Brazil	
Mexico	

Source: The KPMG Green Tax Index, 2013.

Key **findings**

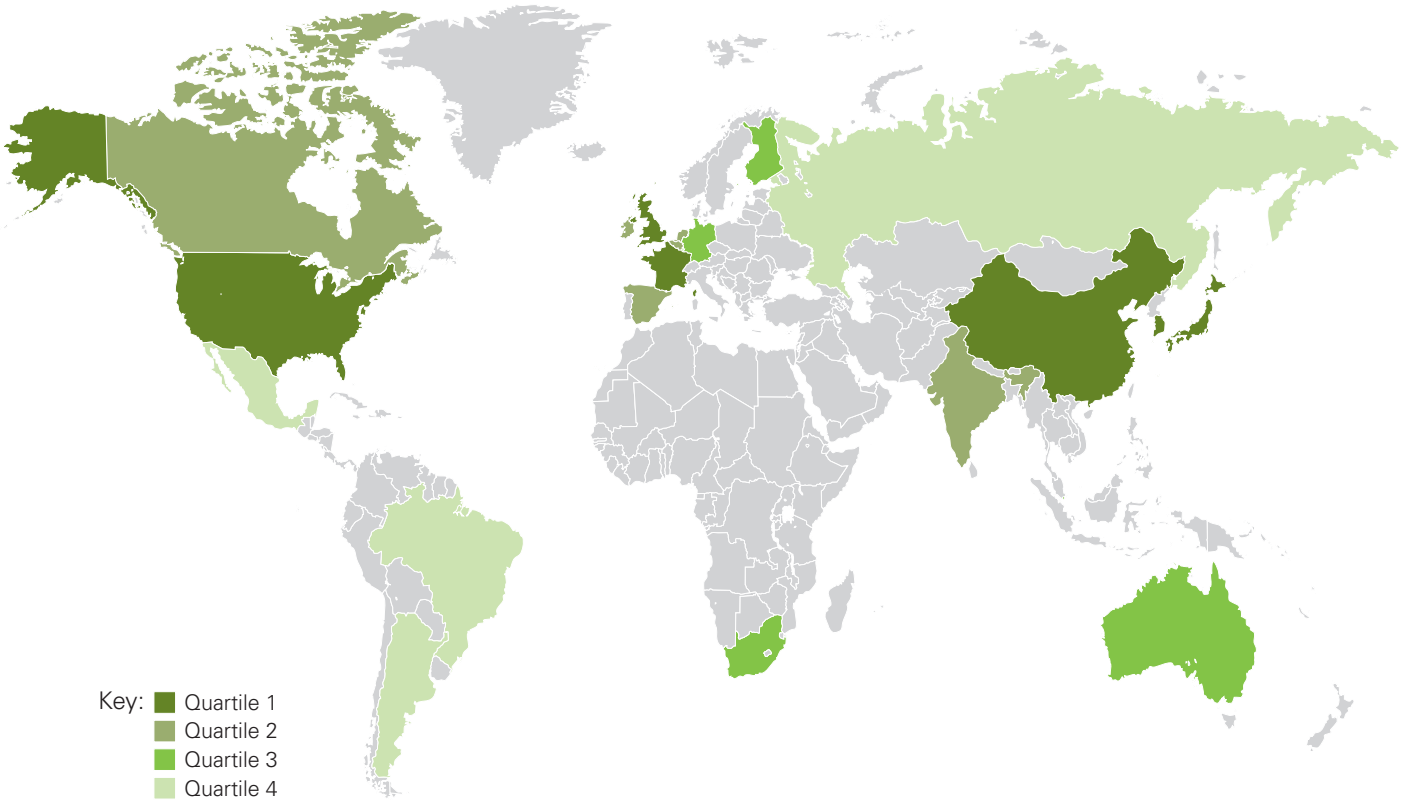
"Japan is ranked second overall but, in contrast to the US, scores higher on green tax penalties than it does on incentives. Japan also leads the ranking for tax measures to promote the use and manufacture of green vehicles."

- The US tops the ranking primarily due to its extensive program of federal tax incentives for energy efficiency, renewable energy and green buildings.
- When green tax penalties alone are considered, the US drops to 14th, indicating that US green tax policy is weighted heavily in favor of incentives.
- Japan is ranked second overall but, in contrast to the US, scores higher on green tax penalties than it does on incentives. Japan also leads the ranking for tax measures to promote the use and manufacture of green vehicles.
- The UK ranks third and has a green tax approach balanced between penalties and incentives. The UK scores most highly in the area of carbon and climate change.
- France occupies fourth place in the overall ranking and is unusual in that its green tax policy is more heavily weighted towards penalties than incentives.
- South Korea ranks fifth overall and, in common with the US, has a green tax system weighted towards incentives rather than penalties. South Korea leads the ranking for green innovation which suggests that South Korea is especially active in using its tax code to encourage green research and development.
- China ranks sixth with a green tax policy balanced between incentives and penalties and focused on resource efficiency (energy, water and materials) and green buildings.
- The US uses green tax penalties less than other Western developed nations, apart from Canada. The only countries in the Index that impose fewer green tax penalties than the US or Canada are emerging economies such as Brazil, India, Mexico and Russia. China and South Africa are both more active than the US or Canada in imposing federal green tax penalties.
- Australia ranks relatively high in the penalties index (sixth), in large part due to its recently introduced carbon price mechanism. However, it ranks lower (19th) in the incentives index. This is because the Australian government does not use tax incentives as widely as many other governments to drive green corporate behavior. The Australian government favors instead non-tax tools such as grants, loans and direct investment. It has allocated billions of dollars to various funding programs, particularly in the areas of clean energy, water efficiency and green innovation.
- Similarly, Germany and Finland rank higher in the penalties index (ninth and fourth respectively) than they do in the incentives index (17th and 21st respectively) because tax is used less commonly there than in some other countries as a tool to address green policy objectives. Germany favors low-interest loan programs and capital subsidies, especially in the areas of energy efficiency, green vehicles and green buildings. Finland focuses on green innovation and provides significant grant funding through Tekes – the Finnish Funding Agency for Technology & Innovation.

Further details of tax incentives and penalties offered by the 21 countries analyzed for the Index are contained in the sections on key areas of green policy.

The 21 countries can also be grouped into four quartiles (as follows), with quartile 1 showing the countries most active in using tax as a green policy tool and quartile 4 showing those that are least active.

The KPMG Green Tax Index: quartiles



Quartile 1	US, Japan, UK, France, South Korea, China	• Highest use of green tax • High number of incentives and penalties places in Quartile 1 • US and South Korea weighted towards incentives • France weighted towards penalties • Japan, UK and China balanced between incentives and penalties.
Quartile 2	Ireland, Netherlands, Belgium, India, Canada, Spain	• Moderate to high use of green tax • Wealth of wind, solar and water resources can help to encourage investment in green technology.
Quartile 3	Australia, South Africa, Germany, Finland, Singapore	• Moderate use of green tax • Strong use of non-tax funding, e.g. significant grant programs in Australia (ARENA), Finland (Tekes) and Singapore (GREET).
Quartile 4	Brazil, Argentina, Mexico, Russia	• Relatively low use of tax as a green policy tool • Only one of the four has a green tax penalty (Russia's water tax) • Other funding programs may be used, e.g. Argentina's feed-in-tariffs program, Brazil's FUNTEC R&D grants.

Source: The KPMG Green Tax Index, 2013.

Rankings by policy category

ENERGY EFFICIENCY	
Netherlands	**1**
Germany	2
Singapore	
China, Russia, South Africa, US	4

CARBON & CLIMATE CHANGE	
UK	**1**
Australia, Finland, South Korea	2
China	5

GREEN INNOVATION	
South Korea	**1**
Canada	2
Brazil	3
Argentina, Belgium, France, US	4

RENEWABLE ENERGY & FUELS	
US	**1**
Japan	2
Canada	3
India	4
Ireland	

GREEN BUILDINGS	
US	**1**
Germany	2
Netherlands	
Belgium	4
China	
France	

GREEN VEHICLES	
Japan	**1**
France	2
UK	
US	4
Belgium, China, Ireland, Spain	5

WATER EFFICIENCY	
South Korea	**1**
China	2
South Africa	3
UK	
Belgium	5
Russia	
Singapore	

MATERIAL RESOURCE EFFICIENCY/WASTE MANAGEMENT	
France	**1**
China	2
Belgium	4
South Korea	
UK	

POLLUTION CONTROL & ECOSYSTEM PROTECTION	
Singapore	**1**
Spain	2
France, Mexico, South Africa,UK, US	3

Source: The KPMG Green Tax Index, 2013.

Green tax incentives and penalties across 21 countries

Country		Argentina	Australia	Belgium	Brazil	Canada
Energy efficiency	Purchase of energy efficient equipment: incentives					
Carbon & climate change	Carbon taxes (national)		x			
	Carbon taxes (sub-national)					x
	Cap-and-trade (national)		x	x		
	Cap-and-trade (sub-national)					x
	Other carbon emission penalties					
	Carbon sequestration/capture & storage incentives		x			
Green innovation	General innovation/R&D incentives for which green technologies may be eligible	x	x	x	x	x
	Carbon capture and storage: innovation/R&D incentives					
	Energy efficiency: innovation/R&D incentives			x		
	Renewable energy and fuel: innovation/R&D incentives				x	
	Water efficient technologies: innovation/R&D incentives					
	Material resources: innovation/R&D					
	Green vehicles: innovation/R&D incentives					
	Waste/recycling: innovation/R&D incentives					x
	Green buildings: innovation/R&D incentives					
	Other green innovation/R&D incentives					x
Renewable energy & fuels	Production of renewable energy and fuels: incentives	x	x			x
	Renewable energy: incentives for direct investment in renewable energy companies					
	Taxes/penalties on conventional (fossil) fuels		x			x
Green buildings	Incentives to build/occupy green buildings					
	Other taxes/penalties/incentives related to green buildings			x		
Green vehicles	Vehicles: taxes/penalties on environmentally unfriendly vehicles			x		
	Vehicles: incentives for production of green vehicles					
	Vehicles: incentives for the purchase/lease/use of green vehicles			x	x	
Water efficiency	Taxes/penalties on water use (national)					
	Incentives to produce or purchase water efficient equipment or water recycling equipment					
	Incentives to reuse/recycle/treat waste water			x		
	Other incentives for the efficient use of water					
Material resource efficiency & waste management	Taxes/penalties on the use of material resources					
	Taxes/penalties on packaging			x		
	Taxes/penalties on consumption			x		
	Incentives for the efficient use of material resources				x	
	Taxes/penalties on commercial waste					
	Incentives for waste recycling/reuse					
Pollution control & ecosystem protection	Taxes/penalties on pollution: air, water, ground, etc.					
	Taxes/penalties on land use change					
	Incentives to encourage companies to conserve or rehabilitate ecosystems/forests			x	x	
	Incentives to invest in environmental protection/rehabilitation					
Non-tax incentives	Grants/loans	x	x	x	x	x
	Feed-in tariffs	x		x		

Source: The KPMG Green Tax Index, 2013.

China	Finland	France	Germany	India	Ireland	Japan	South Korea	Mexico	Netherlands	Russia	Singapore	South Africa	Spain	UK	US
x			x	x	x	x			x	x	x	x		x	x
x	x			x			x					x		x	
															x
	x	x	x		x		x		x		x		x	x	
x						x									x
						x								x	
															x
x		x		x	x	x	x	x	x		x	x	x	x	x
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x		x		x	x	x	x	x	x			x			x
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	x	x	x		x	x			x				x	x	x
x		x	x						x						x
x		x	x			x						x	x	x	x
				x	x										
x	x	x	x	x	x	x	x	x	x		x		x	x	x
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x	x	x	x	x		x			x			x	x	x	

Implications for business leaders, **tax and sustainability professionals**

The global landscape of green tax is both complex and dynamic, as the KPMG Green Tax Index shows. Hundreds of green tax penalties are levied and incentives offered around the world. This number runs well into the thousands when sub-national instruments and non-tax measures such as grants, subsidies and loans are taken into account.

It is also clear from the Index that governments are using tax beyond the policy areas of energy and carbon to address resource efficiency more broadly and to spur green innovation. The green tax landscape is expanding constantly.

Simply being aware of all the relevant instruments in place in all the markets where a company operates is in itself a significant challenge, particularly for multinationals. Resources and attention are often focused first and foremost on compliance with penalty legislation.

This means that, too often, insufficient importance is attached to strategic responses that could reduce exposure to those penalties.

Furthermore, without a proactive approach to green tax incentives, opportunities can be missed and the sums involved can be significant.

For example, KPMG in the US has helped a multinational consumer products company to review its planned investment in an R&D facility. Opportunities of approximately USD30 million were identified related to energy credits, R&D tax deductions and credits, fixed assets and other incentives.

Similarly, also in the US, a review of energy efficient data centers and production facilities for a large software company identified approximately USD40 million of opportunities related to energy efficient building deductions, R&D deductions and credits and other deductions.

KPMG in South Africa assisted a client to apply for a tax allowance for a bio-diesel manufacturing plant. The project was subsequently approved by South Africa's Department of Trade and Industry as a Greenfield project with preferred status, adding a net tax benefit of 252 million South African rand (ZAR) (USD28.5 million).

This shows there are significant opportunities to be grasped beyond cost reduction. Green tax incentives can make or break projects that can help companies reshape their business and develop new markets, products and services.

Yet too often these green tax opportunities fall through the cracks between operations, tax, finance and sustainability functions.

In order for companies to overcome these issues and take advantage of the available benefits of green tax systems, KPMG's network of member firms recommends that business leaders, boards and heads of tax, finance and sustainability work together on the following.

- Ensure a system is in place to monitor the landscape of green tax incentives and penalties worldwide and keep the business informed of relevant developments and their potential usefulness.
- Review the company's response to green tax penalties (such as carbon taxes and cap-and-trade systems) and explore strategies and investments that could reduce current and future financial exposure.
- Review all projects in the pipeline to assess whether green tax incentives have been missed.
- Ensure that all proposals for sustainability programs have return-on-investment calculated on an after-tax basis.
- Build understanding of green tax opportunities across the business and develop communication and collaboration between operations, tax, finance, sustainability and other relevant functions.
- Engage with governments and industry associations to provide a business view of how green tax tools can best be designed to help companies assist governments in achieving their green policy goals.

"Build understanding of green tax opportunities across the business and develop communication and collaboration between operations, tax, finance, sustainability and other relevant functions."

The KPMG Green Tax Index is not intended as the final word in how investment decisions are made, but it can help to focus attention on a challenge that many multinationals struggle with. And that, perhaps, presents the area of greatest opportunity: to bring a greater understanding of the entire financial picture of green investments, pre and post-tax.

Energy **efficiency**

ENERGY EFFICIENCY	
Netherlands	1
Germany	2
Singapore	
China, Russia, South Africa, US	4

Source: The KPMG Green Tax Index, 2013.

Just over half (11) of the countries analyzed for the Index have tax incentives in place to promote energy efficiency in business. *(Note that incentives specific to green vehicles or green buildings are covered separately in those sections).*

The bulk of these incentives are enhanced capital allowances or accelerated depreciation to encourage the purchase of energy efficient equipment.

Evidence on the success of such initiatives is sparse but it has been reported, for example, that the Dutch Energy Investment Allowance (EIA) scheme helped to increase business investment in energy efficiency by 45 percent in 2012 over the previous year.[5]

Other approaches, taken by Germany and Russia among others, involve exemptions from other taxes (such as property or energy taxes) on the basis of energy efficiency performance. South Africa has made energy efficiency a key criterion for potentially generous tax allowances for major manufacturing projects under its Section 121 Tax Allowance Incentive.

Encouraging industry and consumers to use energy more efficiently is widely seen as the first policy choice for governments to ensure the security of supply, protect businesses and consumers against rising costs, support sustainable economic growth, and reduce contributions to climate change.

This is because energy efficiency is inexpensive and easily scalable when compared with more costly approaches such as the development of large-scale renewable power generation.

A report by the United Nations Foundation found that if the G8 and five major emerging economies were to double their rate of energy efficiency improvement, energy demand in each of the G8 countries would be reduced by 20 percent by 2030, a reduction equivalent to the energy produced by 2,000 coal-fired power plants.[6]

Netherlands

VAMIL (or the Netherlands' Accelerated Depreciation of Environmental Investments Measure) provides accelerated depreciation and deductions on qualifying energy efficient assets. Depreciation of up to 75 percent of the investment costs is available and maximum investment costs are 25 million euro (EUR) per asset (USD32 million).

In addition, the EIA provides a deduction of 41.5 percent of investment costs in energy efficient and renewable energy equipment resulting in a net benefit of around 10 percent of the total investment.

It was reported in July 2012 that the EIA had helped to significantly reduce energy consumption and carbon dioxide (CO_2) emissions in the Netherlands and had encouraged Dutch companies to invest around EUR1.5 billion (USD1.8 billion) in energy efficiency in 2011, an increase of 45 percent on the previous year.[7]

Companies in the Netherlands can also apply for a deduction of up to 36 percent of investments in energy efficient equipment under the environmental investment allowance "Milieuinvesteringsaftrek" known as MIA. The maximum investment costs that are taken into account are EUR25 million (USD32 million) per qualifying asset, and assets granted MIA deduction must be retained for at least 5 years. The EIA and the MIA cannot be applied simultaneously to the same assets, however assets can qualify simultaneously for VAMIL and MIA.

Germany

In Germany there are taxes on the use of electricity (StromSteuerGesetz) and fuels (EnergieSteuergesetz). Until 2012, energy intensive sectors were exempted from those taxes or benefited from reduced rates. From 2013, companies in these sectors must have an environmental or energy management system in place to benefit from the reduced electricity tax rates. Additionally, the sector as a whole must achieve an annual energy efficiency improvement of 1.3 percent or they will pay more electricity tax.

[5] http://www.tax-news.com/news/Dutch_Investment_Tax_Boosts_Renewable_Energy_56469.html. Accessed 21 March 2013.
[6] *Realizing the Potential for Energy Efficiency*. United Nations Foundation, 2007.
[7] http://www.tax-news.com/news/Dutch_Investment_Tax_Boosts_Renewable_Energy_56469.html. Accessed 21 March 2013.

Singapore

Singapore provides a 100 percent capital allowance for approved energy saving equipment and technology.

Singapore also has an Investment Allowance (IA) scheme which provides further allowances of up to 100 percent on costs of approved energy efficient plant and machinery, in addition to standard or accelerated capital allowance claims.

China

Enterprises that purchase and use qualified energy saving equipment can apply for a tax deduction of 10 percent of the amount invested. If the deduction is not utilized, it can be carried forward for 5 years. China also provides a custom duty and value-added tax (VAT) exemption for certain imported energy efficient equipment.

China is also supporting the development of an energy services sector in the country by providing attractive tax incentives for energy services companies (ESCOs) and energy users.

For example, a qualified ESCO taking part in an energy performance contracting (EPC) project is eligible for a tax exemption in the first 3 years and a 50 percent tax reduction (an effective rate of 12.5 percent) over the following 3 years. In addition, ESCOs can claim exemption from VAT on the transfer of assets to clients at the end of a project, and assets can be transferred as if fully depreciated for corporate income tax purposes.

Similarly, energy users in EPC projects can deduct reasonable expenses for corporate income tax purposes including service fees and the cost of assets.

Russia

Russian taxpayers are entitled to a 3-year exemption on corporate property tax for newly introduced energy efficient assets such as air conditioners and elevators.

The Russian government also provides a capital allowance for approved energy efficient fixed assets for corporate profits tax purposes. The capital allowance amount can be doubled for certain assets. Investments in energy efficient equipment also qualify for accelerated depreciation at twice the standard rate for profits tax purposes.

South Africa

South Africa's Section 121 Tax Allowance Incentive is designed to encourage the development of major manufacturing projects in the country and offers support for both capital investment and training. While not specific to energy efficiency, this tax allowance is directly relevant because energy efficiency improvements are one of the key criteria on which projects are assessed (due in part to the current and future energy supply constraints the country faces). To qualify under this criterion projects must demonstrate a minimum 10 percent energy saving sustained for a minimum of 4 years. The incentive offers a tax allowance of between 35 percent and 100 percent up to a maximum of ZAR900 million (USD97 million) for greenfield projects with 'preferred' status.

Some 13 projects have been approved (at the time of writing) under Section 121 with a total investment value of approximately ZAR22 billion (USD2.4 billion).

South Africa has also announced, but (at the time of writing) has not yet put into effect, an Energy Efficiency Savings Tax Allowance (Section 12L, Income Tax Act) which proposes a tax deduction based on the amount of energy saved by the taxpayer in the year of assessment. The deduction is proposed to be calculated at ZAR0.45 (USD0.05) per kilowatt hour (or equivalent) of energy saved. The date of introduction is not yet known but it is widely expected to be in 2015.

US

Manufacturers of energy efficient residential appliances, such as dishwashers and refrigerators, are provided with a tax credit. The credit is calculated based on the type of appliance manufactured and its efficiency performance. For example, tax credits of up to USD75 per unit are provided for dishwashers, up to USD225 per unit for clothes washers, and up to USD200 for refrigerators. The maximum credit amount is USD25 million per taxpayer. This incentive, which began in 2007, will expire on 31 December 2013.

Other incentives discussed in other sections of this report include tax deductions for the installation of energy efficient lighting and heating, ventilation and air conditioning (HVAC) systems in commercial buildings (see Green Buildings on page 23).

Other energy efficiency incentives

The **UK** offers a 100 percent first year allowance for specified energy saving plant and machinery. Loss-making companies can opt for an alternative 19 percent tax cash credit up to a maximum of 250,000 United Kingdom pounds (GBP) (USD380,000).

India offers accelerated depreciation at the rate of 80 percent on a long list of energy savings and renewable energy devices, including but not limited to boilers, furnaces and heat pumps.

Similarly, **Ireland** provides accelerated capital allowances of 100 percent in the year of expenditure for the purchase of a wide range of energy efficient equipment including lighting, controls, HVAC and building energy management systems.

Non-tax energy efficiency incentives

Many governments also drive corporate energy efficiency through non-tax incentives including grants, subsidies and loans.

Australia has committed substantial sums to such programs including approximately 800 million Australian dollars (AUD) (USD837 million) to its Clean Technology Investment Program, which provides grants to help Australian manufacturers invest in energy efficient capital equipment and low emission processes and products. Access to grant funding is competitive based on the energy savings to be made and other criteria.

Australia has also committed approximately AUD200 million (USD210 million) to a similar energy efficiency grants program specific to the food and foundry industries, and a further AUD70 million (USD73 million) to grants to help the coal mining industry implement energy saving and carbon abatement technologies.

In addition, the Coal Sector Jobs Package (CSJP) will provide approximately AUD1.25 billion (USD1.33 billion) over 6 years to the most emissions-intensive or 'gassy' coal mines to reduce fugitive emissions through the exploration and implementation of available abatement technologies.

China provides subsidies through central and provincial government agencies respectively. The standard rate of subsidies at the central level is 240 Chinese yuan renminbi (CNY) (USD39) per ton of standard coal saved and no less than CNY60 (USD10) per ton of coal saved at the provincial level. As of April 2013 there were over 2,300 qualified ESCOs in China. These companies can apply for financial subsidies on energy management contracts entered into on or after 1 January 2012. However, such financial subsidies should be taxable with an ESCO for corporate income tax purposes.

Singapore provides funding for up to 20 percent of qualifying costs, capped at 4 million Singapore dollars (SGD) (USD3.2 million) per project, through its Grants for Energy Efficient Technologies (GREET) program.

In **Finland** a new energy efficiency grants program begins in 2013 to replace the expired Energy Aid program. Typically, the amount of funding provided is 15-25 percent of the total project.

In **Belgium,** regional energy efficiency subsidies of up to 50 percent of project costs are offered to commercial and industrial organizations.

Spain is currently designing national and regional measures to help the country achieve its EU obligation of a 20 percent reduction in energy consumption by 2020. Grant funding of up to 40 percent of project costs and a soft loans program are expected.

Carbon & climate change

CARBON & CLIMATE CHANGE	
UK	1
Australia, Finland, South Korea	2
China	5

Source: The KPMG Green Tax Index, 2013.

Almost all of the 21 countries analyzed for the Index have some sort of carbon-related tax mechanism in place. However, each country is unique in the way that it manages its policy response to climate change and carbon emissions reduction and, as a result, the use of tax penalties and incentives varies widely.

True carbon taxes are currently the exception rather than the rule. Australia has implemented a carbon price mechanism which has a fixed price for the first 3 years, and will then transition to a flexible price trading scheme in 2015. South Africa is close to bringing in its own carbon tax and China has committed to do so but delayed its implementation.

Carbon-based tax penalties on high-emission fuels and energy sources, such as gasoline and coal, are more frequently implemented. Also, increasingly seen are emissions trading systems (ETS) whether international, such as the EU ETS, sub-national such as the provincial trading systems being developed in China, or municipal, such as Tokyo's cap-and-trade program. While cap-and-trade systems are not technically taxes, they have been included in this Index as they have become the de-facto alternative carbon penalty to carbon tax.

The message for corporations is that carbon and climate change-related tax penalties and incentives are proliferating around the world. They can be complex to manage and the chances of escaping such charges in a global economy are becoming more remote. In the long term, corporations are likely to be subject to some form of carbon limitation penalties or incentives wherever they operate. Complying with penalties and limiting financial exposure requires careful management.

UK

As well as participating in the EU's ETS, the UK imposes the Climate Change Levy – an environmental tax levied on electricity, gas, solid fuels including coal and liquefied petroleum gas (LPG). The levy is designed to encourage energy efficiency to help the UK meet its targets for cutting GHGs, including CO_2 emissions.

Energy intensive industries may receive up to a 90 percent discount on the Climate Change Levy in return for meeting energy efficiency or carbon saving targets as part of Climate Change Agreements (CCAs). Eligible sectors for CCAs include steel, chemicals, cement and agricultural businesses, such as intensive pig and poultry-rearing.

The UK's Carbon Price Floor (CPF) is a tax on emitting CO_2 paid by electricity generators. It is intended to provide an incentive to invest in low-carbon power generation by providing greater support and certainty to the carbon price. The CPF was introduced from 1 April 2013 at around GBP15.70/ton(t)CO_2 (USD25.51/tCO_2) and will increase at a linear rate to GBP30/tCO_2 (USD48.74/tCO_2) in 2020, and to GBP70/tCO_2 (USD113.74/tCO_2) in 2030.

In addition, large businesses in the UK that consume a certain amount of energy must participate in the Carbon Reduction Commitment Energy Efficiency Scheme (CRC). This scheme is designed to target CO_2 emissions not already covered by CCAs and the EU's ETS.

Organizations eligible for the CRC must buy allowances for the energy they use (electricity, gas, gasoline, diesel or other fuels) and penalties for non-compliance are significant.

Australia

Australia's carbon price mechanism was passed by parliament on 8 November 2011 and commenced on 1 July 2012. The Australian government expects the tax to drive innovation and investment in clean technology.

In January 2013, it was reported that carbon emissions from Australia's

electricity sector had fallen sharply under the first 6 months of the tax with increases in energy efficiency and renewable energy generation. It was also reported that the government's revenues from the tax will be less than expected due to the drop in emissions.[8]

Australia's carbon pricing system starts at a fixed price of AUD23 (USD24) per ton, rising by 2.5 percent per year until 30 June 2015 when it will transition to an ETS. Thereafter, the price will be set by the market, and the number of permits issued by the government each year will be capped.

Finland

Finland's carbon tax applies to multiple industries. This tax is based on the CO_2 emissions of fuels including gasoline, diesel, biofuels, coal, coal brickets and solid fuels, but not wood or other biomass used in energy production.

South Korea

Since the establishment of the Presidential Committee on Green Growth in 2009, South Korea enacted the Framework Act on Low Carbon Green Growth and introduced a national greenhouse gas (GHG) emissions target management scheme. The Ministry of Environment sets the maximum limit of GHG emissions and related authorities supervise performance of companies in the scheme. Whenever companies exceed GHG emissions, the Ministry of Environment imposes penalties.

China

China has determined the amount of its tax penalty, eventually expecting to introduce a levy of CNY5-CNY10 (USD0.80 to USD1.61) per ton of carbon. The tax was proposed in China's latest Five-Year Plan and is intended to apply to carbon emissions from fossil fuels. However at the time of drafting this report, the country had delayed implementation of the program.[9]

Other carbon tax penalties

India's carbon tax is specific to coal only and was first introduced in July 2010. It imposes a tax of 50 Indian rupees (INR) (USD1.07) per ton of coal produced or imported into India. The revenue raised is earmarked for the National Clean Energy funds for research and innovation in clean energy technologies and environmental remedial programs.

> **"The message for corporations is that carbon and climate change-related tax penalties and incentives are proliferating around the world."**

South Africa's carbon tax program, though not yet in force, is close to completion at the time of writing this report, and implementation is likely in 2015. The country's 2013-14 budget review proposed that the tax will initially be levied at ZAR120 (USD13) per ton of CO_2 and will increase by 10 percent per annum during the first implementation period of 2015–2020.

A benchmark of carbon emissions per unit of output has been proposed, and may be defined at an industry sector or sub-sector level.

Companies that emit less CO_2 than the benchmark will receive additional tax-free allowances, whilst those performing below the standard will have their free allowances reduced.

[8] http://www.theaustralian.com.au/national-affairs/climate/emissions-drop-signals-fall-in-carbon-tax-take/story-e6frg6xf-1226559632995. Accessed 21 March 2013.
[9] http://www.bloomberg.com/news/2013-03-06/china-backing-away-from-carbon-tax-start-in-2013-official-says.html. Accessed 25 March 2013.

"Cap-and-trade systems are more widely used by governments than carbon taxes. Of the 21 countries analyzed for this Index, 12 have a national system of some sort or participate in an international carbon trading system."

Japan enforces an additional tax on petroleum and coal (on top of its petroleum and coal tax) based on carbon emissions. This additional tax is part of the Japanese government's Carbon Dioxide Tax of Global Warming Countermeasure in the 2012 tax reform, which aims to control energy-originated CO_2.

Sub-national carbon taxes

Sub-national carbon taxes exist in **Canada** and the **US**, among others. For example, Quebec introduced a carbon tax on certain fuels in 2007. In 2008, British Columbia followed with a tax that applies to the purchase or use of fuels within the province. The US state of California recently enacted a carbon tax at an initial rate of USD10 per ton of carbon content on coal, petroleum and natural gas. The tax will increase by USD10 each year, freezing when a mandated report by the Internal Revenue Service and the Department of Energy determines that CO_2 emissions have decreased by 80 percent from 1990 levels.

Cap-and-trade systems

Cap-and-trade systems are more widely used by governments than carbon taxes. Of the 21 countries analyzed for this Index, 12 (Australia, Belgium, Finland, France, Germany, India, Ireland, South Korea, the Netherlands, Singapore, Spain, and the UK) have a national system of some sort or participate in an international carbon trading system.

Sub-national cap-and-trade programs exist in Canada, China (expected to be implemented in 2013), Japan and the US.

Carbon sequestration incentives and penalties

Carbon sequestration incentives are uncommon, although a few countries do provide benefits.

Australia's Carbon Farming Initiative (CFI) allows farmers and land managers to earn carbon credits by storing carbon or reducing GHG emissions on the land. These credits can then be sold to people and businesses wishing to offset their emissions. The CFI also helps the environment by encouraging sustainable farming and providing a source of funding for landscape restoration projects. The CFI is a carbon offset scheme that is part of Australia's carbon market. Legislation to underpin the CFI was passed by Parliament in August 2011.

The **US** allows a tax credit for CO_2 sequestration of USD10.44 per metric ton (2012 rate) for CO_2 used as a tertiary injectant and then permanently sequestered; USD20.88 (2012 rate) for CO_2 permanently sequestered without first being used as tertiary injectant. This incentive will close in the year in which the Internal Revenue Service determines that 75 million metric tons of CO_2 have been captured and sequestered.

Green innovation

GREEN INNOVATION	
South Korea	1
Canada	2
Brazil	3
Argentina, Belgium, France, US	4

Source: The KPMG Green Tax Index, 2013.

Innovation is not only central to the success of corporations, it is also crucial to governments' green policy objectives. The fact that 18 of the 21 countries analyzed for the KPMG Green Tax Index use their tax systems to encourage research and development (R&D) reflects the importance attached to it.

R&D drives down the cost of technologies, improves the business case for private sector investment, reduces cost to government and enables solutions to be delivered at scale.

While not all R&D tax incentives identified as part of this research are specific to green innovation, green projects are eligible for many broad-based R&D incentives and in some cases benefit from preferential treatment.

In addition, R&D incentives specific to the green agenda have become increasingly common in recent years. For example, South Korea's R&D incentives were updated to focus on a green agenda as part of its 2009 Green Growth Strategy.

Analysis for the Index suggests that most green R&D incentives in place around the world are either tax credits and/or deductions, although some countries offer indirect tax incentives specific to R&D.

Notable countries that do not offer R&D tax incentives include Finland and Germany, which do however have R&D grant programs in place, and Russia.

The KPMG Green Tax Index scores green-specific R&D incentives higher than general incentives because they are focused on green outcomes and non-green projects are not eligible. However, it should be noted that general R&D incentives, when applied to green projects, can also be effective in driving sustainable corporate behavior and, as companies focus on driving innovation, increasing efficiency and cutting costs, they are also likely to reduce the use of fossil fuels and GHGs.

South Korea

The Ministry of Strategy and Finance provides a tax credit of 20 percent (30 percent for small and medium-sized companies) for R&D activities in four key areas: electric, hybrid, plug-in or clean diesel vehicles; solar batteries; wind and geothermal energy; and carbon capture and storage. South Korea ranks first in the green innovation category because it offers tax credits rather than deductions and applies these specifically to multiple areas of green innovation.

Canada

The Scientific Research & Experimental Development (SR&ED) Program is a federal program providing cash refunds and/or tax credits for investment in eligible R&D undertaken in Canada. The program encourages Canadian businesses of all sizes to conduct R&D in Canada. It is the largest single source of Canadian federal government support for industrial R&D and returns as much as a 35 percent federal cash refund. In addition, up to 10 provincial cash refunds are available in certain Canadian provinces. While the program is not designed specifically for green innovation, green projects are eligible.

Brazil

The Brazilian government has established tax incentives applicable to companies that incur expenditures on R&D and technological innovation projects. These tax incentives were established in 2005.

The main tax incentives are:

- deduction of the total amount of expenditure related to R&D for income tax purposes
- additional deduction equal to 60 percent of the total R&D expenditures
- enhanced R&D extra deduction, based on the following criteria: if the entity increases the amount of researchers by up to 5 percent in a given year, the

> **"[In France] companies can access a tax credit of 30 percent on eligible environmental research expenses up to EUR100 million (USD130 million), and 5 percent on eligible expenses above EUR100 million."**

additional deduction raises to 70 percent; and if it increases more than 5 percent in a given year, the super deduction raises to 80 percent of the qualified expenses

- enhanced R&D extra deduction for patents/trademarks: an additional 20 percent deduction is allowed over the costs incurred in a patent/trademark development.

In October 2012, the Brazilian government established a program called "INOVAR-AUTO" which aims to promote the technological development, innovation, security, environmental protection, energy efficiency and quality of vehicles and parts in Brazil.

Entities entitled to the "INOVAR-AUTO" program will be entitled to IPI (sales tax) presumed credit calculated on expenditures made locally.

Argentina

In December 2010, the Argentinian Ministry of Science Technology and Innovation set up a program called PROFIET (Program of Support to the Entrepreneurial Investment in Technology) to encourage entrepreneurial investment in technology. The program focuses mainly on product innovation, process innovation, and innovation in environmental management. It aims to attract investors and venture capital operators with tax credits (limited to USD150,000).

Belgium

Belgium offers a tax deduction of up to 15.5 percent of investments in R&D fixed assets if they have an environmental benefit (14.5 percent for investments made in 2013).

France

Companies can access a tax credit of 30 percent on eligible environmental research expenses up to EUR100 million (USD130 million), and 5 percent on eligible expenses above EUR100 million (USD130 million).

US

Companies are entitled to both an R&D deduction and an R&D credit if engaging in product and processes development and improvements. An R&D deduction is available for research and experimental costs incurred in the development or improvement of a product.

An additional R&D tax credit of approximately 6 percent of expenses is also available in the US for taxpayers that engage in certain activities related to product development and improvement, and manufacturing process improvements. In calculating the credit, costs incurred on wages, raw materials and contract research expenses are included. The R&D expenditures that are part of this credit are enhanced, thus increasing the credit amount, if a company invests in an energy consortium.

Other green innovation incentives

Australia's R&D credit is also notable, providing a targeted, accessible entitlement program that assists businesses to offset or recoup a proportion of R&D related expenditure. The incentive, relevant across all industry sectors including IT-related projects, aims to encourage and support investment in research and development.

Australia's incentive has two dimensions: a 45 percent refundable tax offset for eligible entities with a turnover of less than AUD20 million (USD21 million) per annum; and a non-refundable 40 percent tax offset for all other eligible entities. Unused non-refundable offset amounts may be able to be carried forward to future income years.

R&D tax credits also apply in **Japan** where the creditable amount depends on the size of the company, its total R&D expenditure for a fiscal year and the R&D ratio (calculated by statute). In addition, further tax credit is available until 2014. The maximum creditable amount is 40 percent of the corporation tax liability for the fiscal year (30 percent for the tax credit on total R&D expenditure and 10 percent for the additional tax credit).

South Africa offers 150 percent tax deduction for eligible general R&D, including green and energy saving R&D. A project may qualify, for example, if the innovation is related to changing a production process to a greener method.

India also offers a 100 percent deduction of the revenue expenditure and capital expenditure incurred by a company on scientific research related to its own business. Further, India also offers a weighted deduction of 200 percent of expense incurred on in-house R&D to a company engaged in the business of bio-technology or in manufacturing or production. However, these deductions do not include expenditure on land and buildings.

Singapore's Productivity & Innovation Credit (PIC) provides 400 percent tax deduction on the first SGD400,000

(USD320,000) of qualifying R&D expenditure for each year of assessment, and 150 percent on expenditure in excess of SGD400,000 (USD320,000). From 2013, businesses may opt to convert up to SGD100,000 (USD80,000) of the qualifying expenditure into a non-taxable cash payout at the rate of 60 percent.

Non-tax incentives

Many governments offer a variety of grant programs to support green R&D.

- **Australia** has a number of major programs and initiatives including the AUD3.2 billion (USD3.3 billion) ARENA initiative to promote innovation in renewable energy; AUD300 million (USD311 million) to help the steel industry become efficient and economically sustainable in a low-carbon economy; and the AUD200 million (USD208 million) Clean Tech Innovation Program.
- **Canada** has a program to support the development of eligible landfill waste diversion projects with up to 50 percent of total project cost.
- **Finland**'s Tekes program offers, among other initiatives, funding specific to natural resources and a sustainable economy. Current funding programs include BioRefine (new biomass products) 2007-2012, Functional Materials 2007-2013, Water 2008-2012, Green Growth 2011-2015 and Green Mining 2011-2016.
- **Germany** has numerous subsidies for R&D in the field of photovoltaics, wind power, geothermal, solar thermal power plants, low-temperature solar thermal and electromobility. The subsidies include capital subsidies and low interest bearing loans. Around EUR4 billion (USD5.2 billion) annually is reserved for high-tech R&D projects in the form of nonrepayable project grants (not specific to green projects). Grant rates can reach up to 50 percent of eligible project costs and cooperation between project partners, especially between enterprises and research institutions, is usually required.
- **Singapore** offers a wide variety of grants through government agencies. For example, the Research Fund for the Built Environment is a SGD50 million (USD40 million) funding initiative by the Ministry of National Development (MND) that will cover up to 75 percent of the cost of the project, subject to a cap of SGD2 million (USD1.6 million). Under the MND Research Fund, key focus areas include sustainable development projects such as integrating solar technologies into building facades.[10]
- Also in Singapore, the Environment and Water Research Programme (EWRP) funds institutes and companies to research and develop new environmental and water technologies (EWT) that lead to significant and sustainable growth opportunities. Funding of up to 70 percent is provided for companies.
- In the **US**, more than 20 government agencies offer grants related to the green space. These vary in amount and there may be more than 1,000 grant programs in operation at any one time. An example of a green-specific grant program is the USD100 million fund offered by the National Energy Technology Labs to recipients that can provide solutions for addressing emissions from coal-powered electricity generation.

[10] http://www.greencollarasia.com/2012/08/18/2012-guide-to-singapore-government-funding-and-incentives-for-the-environment/. Accessed 21 March 2013.

Renewable energy & **fuels**

RENEWABLE ENERGY & FUELS	
US	1
Japan	2
Canada	3
India	4
Ireland	

Source: The KPMG Green Tax Index, 2013.

Renewable energy and fuels is one of the policy areas where governments are most active in putting tax incentives in place and this includes the governments of developing and emerging economies. For example, Argentina, Mexico, China, India and South Africa all offer tax incentives in this area.

Tax incentives for renewable energy and fuels identified as part of this research include the full spectrum of available tools including credits, capital allowances and indirect incentives.

The US leads the Index ranking for renewable energy and fuels due to the large number of tax incentives it offers linked to this policy area. A good example of the effectiveness of tax incentives is the US wind energy production tax credit (PTC) which is widely credited with playing a key role in the development of the US wind energy industry by improving the returns for investors and enabling wind power to compete in the market.

Between 1992, when the PTC was first implemented, and the end of 2011, US wind power capacity grew 30-fold to account for 4 percent of the US' 'total power generation capacity.[11] The scheduled expiration of the PTC at the end of 2012 was linked to a surge in installation that made 2012 a record year for wind power. Installations were up 102 percent on the previous year and wind power ended the year with a 6 percent share of overall US generation capacity.[12]

When it comes to tax penalties on conventional fossil fuels, the KPMG Green Tax Index demonstrates a clear difference in approaches between developed and developing or emerging economies.

Only the developed countries, among the sample analyzed for this Index, impose tax penalties on conventional fossil fuels; they include the US, Canada, Japan, Australia and the European countries. Developing or emerging economies appear to avoid taxing conventional fuel, presumably on the basis that such penalties could damage development and growth prospects.

This section of the KPMG Green Tax Index reviews which governments are most active in using their tax codes to incentivize the production, or use of, renewable and alternative fuels, and/or to penalize the use of fossil fuels.

US

The US tax code provides various tax credits including a production tax credit on renewable energy. The rate varies, but is based on the number of kilowatt hours produced and sold to an unrelated taxpayer.

An investment tax credit of 10 to 30 percent on the cost of renewable energy equipment is also available in the US which, like the production tax credit, has varying expiry dates, depending on the technology purchased, installed and used. At the time of writing, a credit is also available for companies expanding their facilities to manufacture renewable energy equipment, and biofuel producers are also provided a credit based on the amount of fuel produced.

Users of certain fuels are also provided an indirect tax credit, for example users of liquefied hydrogen are provided a credit of USD0.50 per gallon.

In addition to the various tax credits to incentivize renewable energy production and use, the US also offers tax deductions. These include a capital allowance of 50 percent of the cost of cellulosic biofuel production equipment. This incentive is not permanently within the tax code, and is scheduled to expire at the end of 2013.

In terms of penalties, fuel excise taxes are also imposed by the US federal government. Currently, the federal tax on gasoline is 18.4 US cents per gallon.

[11] http://www.eia.gov/todayinenergy/detail.cfm?id=8870. Accessed 14 April 2013.
[12] http://about.bnef.com/press-releases/burst-of-construction-in-december-delivers-record-year-for-us-wind/. Accessed 14 April 2013.

Japan

Japan penalizes the use of numerous fossil fuels with taxes including an oil and gas tax, a diesel oil delivery tax and an aviation fuel tax. Furthermore, an electric power-development promotion tax is levied on electric utilities at a rate of 375 Japanese yen (JPY) (USD4) per 1,000kw/h of power sold. This measure was specifically enacted in the 1970s to promote the generation of clean power as an alternative energy to oil. The tax is passed on by the utilities to end users (both households and industry).

Japan also applies petroleum and coal tax to the shipment of crude petroleum, gaseous hydrocarbons or coal from extracting stations or bonded areas.

Japan provides several significant incentives specific to renewable energy and fuel. These include a special depreciation of 30 percent or 100 percent for the purchase and installation of qualified renewable energy equipment.

In addition, Japan also provides an incentive for fixed assets tax on certain renewable energy generation facilities, qualified under the Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities, and acquired during the period from 29 May 2012 to 31 March 2014 (tax base reduction by one third).

Canada

Canada's ecoEnergy for Biofuels initiative, which started in 2008, aims to invest 1.5 billion Canadian dollars (CAD) (USD1.47 billion) over 9 years to boost the country's production of biofuels. The incentive offers a tax credit for every liter of biofuel produced and sold.

Canada also provides various accelerated tax deductions for renewable energy generation. The accelerated rate of write-off varies from 30 percent to 100 percent per year depending on type of equipment and/or component purchased. Certain expenses can be carried forward indefinitely for use in future tax years, or flow to investors.

Canada imposes an excise tax of CAD0.10 per liter on unleaded gasoline, ethanol and unleaded aviation fuel with a lower rate applied to diesel and biodiesel.

India

Many incentives specific to renewable energy are available to Indian taxpayers. These tax incentives include accelerated depreciation of 80 percent of the cost of a wide range of specified renewable energy assets such as solar power generating systems, wind turbines and biogas plant.

In addition, India provides a tax holiday of 10 years within the first 15 years of operations for renewable energy facilities that began to generate and transmit power before 31 March 2013. India has proposed to extend this benefit to facilities which will begin to generate and transmit power before 31 March 2014.

Exemptions from indirect taxes include an outright exemption from excise duty on the manufacture of specified alternative energy devices, machinery and systems related to renewable power generation, and on parts used in the manufacture of wind turbine blades.

Ireland

Ireland offers an accelerated capital allowance (100 percent in the year of expenditure) for purchases of solar, wind and biomass equipment.

Other renewable energy and fuel incentives and penalties

Like many other countries, the **UK** imposes a duty on certain fuels. The UK imposes a heavy duty on fuel at

GBP0.5795 per liter of unleaded gasoline or diesel (USD3.40 per gallon) compared with a duty of only 18.4 US cents per gallon in the US. The fuel duty was frozen by the government in 2013 until at least September 2014. Together with VAT, the total tax take on gasoline and diesel in the UK is around 60 percent of the pump price.

China has an accelerated depreciation policy for domestic enterprises that purchase listed renewable energy equipment. It also provides 3 years corporate income tax exemption and 3 years 50 percent reduction for income derived from certain renewable power projects, as well as tax credits for the purchase of renewable power generation equipment.

Argentina also provides tax deduction and indirect incentives specific to biofuel and renewable energy production.

South Korea provides a tax credit for the purchase and installation of renewable energy equipment. A 10 percent credit of the investment amount for geothermal, solar, fuel cell, wind energy, biomass, municipal solid waste and hydropower equipment applies to investments made before 31 December 2013.

Non-tax incentives

In **Australia,** the Australian Renewable Energy Agency (ARENA) administers AUD3.2 billion (USD3.34 billion) of funding with the aim of improving the competitiveness of renewable energy technologies and increasing the supply of renewable energy in Australia. ARENA oversees previously allocated funding under a number of programs, with current funding initiatives being Regional Australia's Renewables, Emerging Renewables Program, Advanced Biofuels Investment Readiness Program and the Renewable Energy Venture Capital Fund.

Australia's Clean Energy Finance Corporation is an AUD10 billion (USD10.5 billion) commercially-oriented loan organization established by the national government. Its objective is to overcome capital market barriers that hinder the financing, commercialization and deployment of renewable energy as well as energy efficiency and low-emissions technology.

In **Canada**, the Canadian Sustainable Development Tech Canada Fund has CAD1.1 billion (USD1.1 billion) in government funding, and manages various programs, including the Next Generation Biofuels Fund of CAD500 million (USD490 million). This fund supports up to 40 percent of eligible costs for first-of-kind large scale demonstration facilities for next-generation renewable fuels. The contribution will be repayable at a rate based on the company's free cash flow over a period of 10 years after project completion.

Various government agencies in **Finland** provide grants and loans to support renewable energy. They include Energy Aid which provides subsidies to businesses, municipalities and corporations for investment in renewable energy as well as energy efficiency and diversification of the energy supply. Energy Aid provides up to 25 percent of project costs. Finland's Tekes program also provides many different grants to encourage the development and growth of renewable energy.

India provides capital subsidies for solar thermal technology of up to INR6,000 (USD111) per square meter of collector area, or 30 percent of project cost, whichever is less. For projects in rural areas that lack electricity and in certain 'special category' Indian states, subsidies for up to 60 percent of project costs are available.

In addition, soft loans may also be available for up to 80 percent of project costs at a rate of 5 percent.

Various grant programs are available in **Singapore** to encourage the use of renewable energy technology. Examples include the Solar Capability Scheme which provides grants of up to 30 percent for solar technology, capped at SGD1million (USD800,000) per project. The scheme's objective is to encourage the integration of solar technologies into energy efficient buildings and build the capabilities of companies engaged in engineering, architecture and system integration.

Feed-in tariffs

Of the 21 countries analyzed for this Index, over half (12) have a national feed-in tariff program to support the generation of renewable energy, namely a fixed price paid for renewable energy over the fixed term. The total number of countries with feed-in tariffs globally is over 50. The recent trend has been for feed-in tariff rates to drop as costs of solar equipment, especially photovoltaic modules, fall and some cash-strapped governments look to cut spending.

The KPMG Green Tax Index does not cover feed-in tariffs in detail because it focuses on tax-based penalties and incentives. Further information on feed-in tariffs and other incentives specific to renewables can be found in a sister publication from KPMG International: *Taxes and Incentives for Renewable Energy.*[13]

[13] http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/taxes-incentives-renewable-energy-2012.pdf.

Green **buildings**

GREEN BUILDINGS	
US	1
Germany	2
Netherlands	
Belgium	4
China	
France	

Source: The KPMG Green Tax Index, 2013.

Buildings accounted for approximately one third of global energy-related CO_2 emissions in 2004, according to the Intergovernmental Panel on Climate Change (IPCC).[14]

The buildings sector also offers the largest low-cost emissions reduction opportunity for governments worldwide when compared with other sectors, including energy generation, transportation, industry and agriculture.[15]

It therefore comes as no surprise that governments are increasingly focusing policy on reducing the energy consumption of buildings, as well as improving their water efficiency and the sustainability of building materials.

While non-tax approaches such as grants and subsidies remain, for the time being, the preferred tools to encourage the construction and occupation of green buildings, tax-related instruments

"The buildings sector offers the largest low-cost emissions reduction opportunity for governments worldwide."

[14] http://www.ipcc.ch/pdf/presentations/poznan-COP-14/diane-urge-vorsatz.pdf. Accessed 19 March 2013.
[15] http://www.ipcc.ch/pdf/presentations/poznan-COP-14/diane-urge-vorsatz.pdf. Accessed 19 March 2013.

do exist. These offer potential benefits for corporations and warrant exploration.

In the analysis undertaken for this Index, no tax penalties were identified specific to the energy consumption of commercial buildings. Countries that rank at the top of the Index in the green buildings category do so due to the number of incentives they have in place.

US

The US tax code includes two federal tax incentives specific to efficient buildings. Firstly, a tax credit is available to the construction industry of USD1,000 for every home built that is 30 percent more energy efficient than standard, and USD2,000 for every home that is 50 percent more efficient.

In addition, within the US, companies may claim a tax deduction (under Section 1797D) for the cost of equipment installed in commercial buildings that significantly reduces heating, cooling or lighting costs. The deduction is equal to the cost of such energy efficient commercial building property placed in service during the taxable year. The amount of the deduction cannot exceed USD1.80 per square foot.

Germany

Germany provides deductions and accelerated depreciation in relation to leased and owned buildings that meet certain requirements. The deductible/depreciable amount varies depending on whether the building is leased or owned, the length of lease or ownership and the location of the property.

Netherlands

Investments in green buildings may qualify for accelerated depreciation under the Dutch VAMIL program, which aims to encourage corporate investment in environmentally friendly assets. Accelerated depreciation of up to 75 percent of the cost of the qualifying asset is permitted, with a maximum of EUR10 million (USD13.1 million) applied to investments in real estate.

Belgium

Real estate in Belgium is subject to a tax known as the "immovable withholding tax". Owners of real estate pay the tax at a rate of 1.25-2.5 percent of its deemed rental value depending on the location, although municipal surcharges can increase that to an effective rate of 50 percent of rental value or more. A reduction of this real estate tax is provided if the building meets certain green criteria based on the building's level of insulation.

China

In China, a VAT exemption applies for enterprises that produce building materials that contain at least 30 percent recycled industrial waste such as coal refuse or fly ash.

France

France provides an exemption for up to 5 years from local property tax (either 50 percent or 100 percent) for buildings which qualify as low energy consumption. Application of this exemption is subject to a prior adoption by the local municipality.

Other green building tax incentives

The **UK**, although it does not have a specific tax provision for green buildings, does offer enhanced capital allowances on equipment that improves the energy performance of buildings. The allowance provides a 100 percent deduction for approved energy efficient equipment including heating, lighting and ventilation systems. For loss-making companies, a 19 percent tax cash credit is available up to GBP250,000 (USD380,000).

Non-tax incentives

Many governments are providing grants and subsidies to encourage more efficient buildings.

China, for example, brought in subsidies for both the construction of new energy efficient buildings and the retrofitting of existing buildings in 2012. Subsidies are calculated according to the square meter floor area of the building and can be as much as CNY80 (USD13) per square meter. Grants of up to CNY50 million (USD8 million) are available for the construction of green buildings in designated green ecological city zones.

Germany, by contrast, offers low-interest loan programs for energy efficient construction and retrofitting, and these are widely available to corporations and institutions as well as private individuals.

Singapore has a variety of non-tax incentives in place. These include the Green Mark Incentive Scheme for Existing Buildings which provides cash incentives to encourage energy efficient retrofits. In July 2012, the scheme was enhanced to provide up to 50 percent of retrofit costs, capped at SGD3 million (USD2.5 million). A similar Green Mark scheme provides funding for developers to engage environmental design consultants in the planning phase for new buildings.

Singapore's Building & Construction Authority (BCA) has also set up a SGD15 million (USD12 million) Sustainable Construction Capability Development Fund to boost Singapore's resource efficiency through waste minimization and recycling. The fund provides up to 50 percent of qualifying costs to companies to develop capabilities in the recycling of waste from demolition and in the use of recycled materials for construction.

Green **vehicles**

GREEN VEHICLES	
Japan	1
France, UK	2
US	4
Belgium, Ireland, China, Spain	5

Source: The KPMG Green Tax Index, 2013.

This section of the Index analyzes which governments are most active in using their tax systems to promote greener, fuel-efficient, electric or hybrid vehicles and reduce fossil-fuel consumption in transport.

This category includes tax penalties associated with vehicle use and purchase, as well as tax incentives related to the production, purchase or lease of green vehicles. Note that tax penalties and incentives related to fuels rather than vehicles are included in the renewable energy & fuels section.

Of the 21 countries analyzed for this Index, all except two (Argentina and Russia) have some sort of tax incentive and/or penalty related to green vehicles.

Several of the countries identified here as the most active in green vehicle tax policy (Japan, France, the US and China) are also among the world's top 10 net oil importers according to the International Energy Agency (IEA).[16]

"Of the 21 countries analyzed for this Index, all except two have some sort of tax incentive and/or penalty related to green vehicles."

[16] IEA. 2012 *Key World Energy Statistics*.

It could therefore be argued, that these countries in particular could benefit from reducing oil consumption by transport.

It should be noted that many governments are also using non-tax approaches, such as direct subsidies to green vehicle industries. These have not been factored into the scoring of the Index but some examples are provided.

The background to burgeoning green vehicle tax policy is a rapid growth in demand for road transport. In its 2012 *World Energy Outlook*, the IEA predicted that the number of passenger cars will double between 2011 and 2035 to 1.7 billion, and demand for road freight will also increase rapidly. Much of the increase will be driven by demand from developing countries and the growth of the 'global middle class'.

Transport already accounts for well over half (62 percent) of world oil consumption, up from only 45 percent in 1972, and the IEA predicts this share will increase.

These trends present governments, especially those that are net importers of oil, with a challenge: how to continue to satisfy demand for transportation in a world where fossil fuel markets are increasingly volatile and unpredictable, prices of oil are rising almost continuously, and security of supply is an increasing concern.

Furthermore, many governments also face challenges from severe city pollution due to fossil fuelled vehicles, and the impacts of climate change, to which transportation is a major contributor.

According to the Asian Development Bank, transportation accounts for 23 percent of energy-related CO_2 emissions and many experts predict a three to five-fold increase in emissions from transportation in Asian countries by 2030.[17]

Japan

Vehicle-related tax penalties in Japan are numerous and include oil, petroleum and gas taxes, and taxes related to vehicle size, types and use. Owners of automobiles pay an annual tax based on engine size. For private passenger vehicles with engine displacement of between 1500 and 2000 cubic centimeters (cc), the tax rate is JPY39,500 (USD420) per year. There is also an additional tax on the purchase of a private vehicle payable at the time of new registration or transfer registration. A reduction in this tax rate is available for certain fuel efficient vehicles, but the current (at the time of writing) rate for private cars (before the reduction) is 5 percent of the vehicle's value at the time of acquisition.

An additional motor vehicle tonnage tax is payable at the time of inspection or registration. Tax rates vary according to the type of vehicle, weight of vehicle and the intended use of the vehicle. For example, a tax rate for private passenger vehicles weighing not more than a ton is JPY8,200 (USD87) per year. Additional motor vehicle tonnage tax allowances are provided if vehicles satisfy certain requirements.

Tax incentives specific to vehicles include a capital allowance for certain refueling equipment. Alternative refueling equipment is included in Japan's capital allowance of 30 percent of the cost of new advanced low-carbon and energy saving equipment, provided that the asset is purchased or produced in the period from 1 June 2011 to 31 March 2016 and put in use by business in Japan within a year.

France

France penalizes the use of vehicles heavily. In fact, the country imposes four types of penalties. The tax penalties include a surcharge on the acquisition of a polluting vehicle, applicable to passenger cars registered for the first time in France. The amount of the surcharge varies depending on the CO_2 emission rate (g/km) of the vehicle and rates are reduced by 40 percent for vehicles that use super-ethanol E85 (except for vehicles producing more than 250 g/km CO_2). As from 2013, the amount of the surcharge has been significantly increased compared with the previous year.

In common with Belgium, the UK and some others, France also taxes company cars , though certain hybrids are exempt. Any passenger car used by a business in France is subject to the tax, no matter which country the company is registered in. The rates of the tax vary according to the CO_2 emission rates (g/km) of the vehicle. In addition, capital allowance rates for polluting tourism vehicles are limited to EUR9,900 (USD12,860) versus EUR18,300 (USD 23,770) for other vehicles. Trucks are also taxed, depending on maximum loaded weight excesses of 3.5 tons.

UK

The UK also has an annual car tax calculated on CO_2 emissions and fuel type. The most polluting vehicles, emitting over 255g CO_2/km, are taxed at GBP475 (USD 723) per year whereas vehicles emitting 100g or less of CO_2/km are exempt.[18]

Company cars in the UK are taxed, again with rates determined by the type of vehicle, fuel type and CO_2 emissions. The UK also provides a 100 percent first year capital allowance for vehicles meeting low-emission requirements (less than 110gm CO_2/km).

[17] Asian Development Bank. July 2010. *Reducing Carbon Emissions from Transport Projects*.
[18] https://www.gov.uk/vehicle-tax-rate-tables. Accessed 23 March 2013.

London charges a congestion charge fee of GBP10 (USD15) per day from which low-emission vehicles are exempt.

US

In common with many countries analyzed in this Index, the US taxes large vehicles ('gas guzzlers'). The US government established its Gas Guzzler Tax as part of the Energy Tax Act of 1978 in order to discourage the production and purchase of fuel-inefficient vehicles. The Gas Guzzler Tax is assessed on new cars that do not meet required fuel economy levels, currently 22.5 miles per gallon. These taxes apply only to passenger cars. Trucks, minivans and sport utility vehicles (SUV) are not covered because these vehicle types were not widely available in 1978 and were rarely used for non-commercial purposes. The US' Internal Revenue Service is responsible for administering the Gas Guzzler program and collecting the taxes from car manufacturers or importers. The amount of tax is posted on the window stickers of new cars — the lower the fuel economy, the higher the tax.

The Gas Guzzler Tax for each vehicle is based on its combined city and highway fuel economy value. Fuel economy values are calculated before sales begin for the model year. The total amount of the tax is determined later and is based on the total number of 'gas guzzler' vehicles sold that year. It is assessed after production has ended for the model year and is paid by the vehicle manufacturer or importer.

Incentives enacted in the US include a tax credit for qualified fuel cell vehicles, varying in amount from USD4,000 to USD40,000, depending on vehicle weight and date of purchase. An additional USD1,000 to USD4,000 credit for the purchase of fuel efficient vehicles such as electric vehicles. The credit is not permanent and various provisions are set to expire by 2014. In addition, the US (like Japan) provides a tax credit, which is set to expire at the end of 2013, for alternative vehicle refueling equipment. The credit amount is calculated as 30 percent of the cost of the equipment, but is limited to no more than USD30,000 per taxpayer.

Belgium

Belgium penalizes companies for providing environmentally unfriendly vehicles to employees. The penalty rate is linked to the vehicle's CO_2 emissions.

Ireland

Accelerated capital allowances of 100 percent in the year of expenditure are available in Ireland for equipment purchased to manufacture certain energy efficient vehicles, such as electric, plug-in, lean burn and hybrids. In addition, Ireland provides lowered vehicle registration taxes for more fuel efficient/low-emission vehicles.

Spain

The Spanish government, in common with many other countries, offers preferential registration tax rates on lower emission vehicles. Preferential rates for greener vehicles can also apply to the Mechanical Traction Tax, Spain's second vehicle tax for which rates are set by local governments.

China

In January 2012, China enacted a policy on purchase tax reduction or exemption for greener vehicles. Under the policy, purchase tax is reduced by 50 percent for eligible fuel-saving vehicles and exempted for eligible alternative fuel vehicles.

Non-tax incentives

Many countries offer a variety of non-tax incentives aimed at promoting the uptake of greener, low-emission and alternative fuel vehicles.

Australia, for example, has an LPG Vehicle Scheme which is aimed to increase the use of LPG as a transport fuel. Grants are provided for conversion of registered vehicles to LPG (AUD1,000) (USD915) or the purchase of new LPG vehicles (AUD2,000) (USD1830). Grants are capped to 25,000 eligible claims per financial year. This program started in July 2011.

Canada's Freight Technology Incentives Program provides cost shared funding to support the purchase and installation of proven technologies that can reduce the emissions of air pollutants and GHGs. Examples include: hybrid switching locomotives, diesel anti-idling equipment and electronic speed control systems. The program requires a minimum funding request of CAD25,000 (USD24,439) – a maximum of 50 percent of project total eligible costs, or CAD500,000 (USD489,000) over a 2-year period.

China's 12th Five-Year Plan, announced in March 2011, identified clean energy cars as one of three key investment areas.[19] In March 2013, it was reported that China would impose strict new fuel efficiency standards on new cars. The rules will cut average fuel consumption to 6.9 liters per 100km (34 miles per gallon) by 2015 and to 5 liters per 100km (47 miles per gallon) by 2020.[20]

China has implemented a pilot program of subsidies in five cities, including Shanghai and Shenzhen, where subsidies are paid to manufacturers in

[19] http://www.kpmg.com/cn/en/IssuesAndInsights/ArticlesPublications/Documents/China-12th-Five-Year-Plan-Energy-201104.pdf. Accessed 23 March 2013.
[20] http://uk.reuters.com/article/2013/03/21/us-china-auto-fuel-idUKBRE92K03E20130321. Accessed 24 March 2013.

"Since January 2011, the UK offers a plug-in car grant. The program provides a 25 percent grant towards the cost of new plug-in cars."

order to reduce the price for purchasers. Despite 'lackluster' sales due to high production costs, China has announced it will retain and fine tune the subsidy system.[21]

In **Japan** the government provides subsidies ranging from JPY70K (USD740) to JPY900K (USD9,500) to purchasers of new eco-friendly vehicles satisfying certain fuel efficiency standards, provided that the vehicles are purchased in the period from 20 December 2011 to 31 January 2013 and used for more than a year by the same individual. Japan allocated a budget of JPY300 billion (USD3.2 billion) for these subsidies.

In **Spain** the government approved a EUR72 million (USD103 million) fund to promote electric vehicles in May 2011. The incentives include direct subsidies for the acquisition of new electric cars for up to 25 percent of the purchase price, before tax, to a maximum of EUR6,000 per vehicle (USD8,600), and 25 percent of the gross purchase price of other electric vehicles such as buses and vans, with a maximum of EUR15,000 (USD19,300) or EUR30,000 (USD38,600) depending on the range and type of vehicles.

Since January 2011, the **UK** offers a plug-in car grant. The program provides a 25 percent grant towards the cost of new plug-in cars, capped at GBP5,000 (USD7,615). Vehicles must meet certain criteria, including emissions levels, range, minimum top speed, warranty, battery performance, safety. The list of eligible vehicles is continually updated, and certain vans were recently included.

[21] http://www.china.org.cn/business/2013-03/18/content_28274515.htm. Accessed 24 March 2013.

Water efficiency

WATER EFFICIENCY	
South Korea	1
China	2
South Africa	3
UK	
Belgium	5
Russia	

Source: The KPMG Green Tax Index, 2013.

There are plenty of dire predictions about water.

Supplies will fall 40 percent short of what the world needs within the next 20 years, says the 2030 Water Resources Group.[22] We will run out of water long before we run out of oil, according to the Chairman of Nestlé.[23] And Hilary Clinton believes the risk of future conflicts over water "raises serious security concerns."[24]

Yet business approaches to water scarcity are often tactical and short term, and not always built around a longer-term strategic vision.

In a recent study, KPMG found that most of the world's top 250 companies (80 percent) mention water scarcity in their corporate responsibility reports, but only half report that they have a strategy to deal with it.[25]

In an attempt to address water scarcity issues, governments – especially of emerging economies – are increasingly turning to their tax toolkits to encourage corporations to conserve and recycle limited water supplies.

The most common approaches are tax credits, deductions or accelerated depreciation for expenditure on water-saving, recycling or treatment equipment. Russia is unusual in that it has a water tax as part of its federal tax code.

Although water incentives and penalties have not traditionally been widely regulated through governments' tax legislation, KPMG expects that increasing levels of water scarcity will prompt more governments to use their tax codes to modify behavior in the future.

South Korea

South Korea offers various incentives related to water scarcity and conservation including a tax credit for 10 percent of expenditure on water conservation, treatment or recycling equipment. This applies to investments made until 31 December 2013.

An additional tax credit of up to 6 percent is available if the company acquires new equipment specifically to carry on a business to treat waste water or waste material (including recycling) and maintains or increases the number of employees compared to the previous year. This provision stops on 31 December 2014.

China

China, since 2008, has offered businesses 3 years corporate income tax exemption and a 50 percent reduction for a further 3 years on income derived from water conservation. In addition, 10 percent of the amount invested in specialized equipment used in water conservation may be credited against tax payable by the enterprise for the current year.

South Africa

South Africa allows businesses to deduct 100 percent of their investments in water treatment or recycling assets over a period of 4 years.

UK

The UK offers enhanced capital depreciation of 100 percent of qualifying water efficient equipment in 1 year.

Belgium

Real estate in Belgium is subject to a tax based on its rental value depending on the location. With municipal surcharges, the effective tax rate can be 50 percent of rental value or more. Water treatment sites are exempted from this tax.

[22] Water Resources Group, 2009. *Charting Our Water Future.*
[23] http://www.nestle.com/csv/Nestle/messagechairman/Pages/messageChairman.aspx. Accessed 6 June 2012.
[24] http://www.bloomberg.com/news/2012-03-21/u-s-intelligence-says-water-shortages-threaten-stability.html. Accessed 18 June 2012.
[25] KPMG International. October 2012. *Water Scarcity: A dive into global reporting trends.*

Russia

Few governments impose a state or federal water tax, although most charge levies or fees via regional water authorities and/or environmental agencies.

One of the exceptions is Russia, where there is a federal water tax as part of the Russian Federation tax code, although tax rates are differentiated according to what the water is used for and which river basin it is extracted from.

Other water-related tax incentives

Singapore is also noteworthy in that it prices its water to reflect its scarcity value and, in 1991, introduced a Water Conservation Tax designed to encourage efficient use of water. For non-industrial businesses, the rate of this tax is 30 percent but industrial usage is exempt.[26]

Australia is in the process of implementing legislation that will exempt grants provided under the Sustainable Rural Water Use and Infrastructure Program from both income tax and capital gains tax. Waste water is also a covered sector under Australia's carbon price mechanism and, as such, there is a financial incentive to minimize carbon emissions from waste water through recycling and treatment.

India does not yet have tax incentives in place for the installation or use of water efficient equipment, but the Indian government is soon expected to introduce a water regulatory body, the National Bureau of Water Use Efficiency. Tax incentives may be introduced thereafter.

Non-tax incentives

Many countries are encouraging more efficient use of water and addressing water scarcity issues using non-tax instruments and incentives such as grants and subsidies. This Index focuses on tax-related instruments and so grants have not been factored into the scoring, however the following are examples of notable initiatives.

Australia uses direct grant funding to influence behavior in the water sector, as it does in other environmental areas. For example, the Australian government is providing AUD450 million (USD470 million) for the On-Farm Irrigation Efficiency Program and has committed AUD3.1 billion (USD3.23 billion) to the "Restoring the Balance" in the Murray-Darling Basin program to purchase water for the environment. Many of Australia's programs focus on specific regions of the country, especially those that rely heavily on catchment areas, such as the Murray-Darling Basin.

Singapore's government has various significant grant programs currently in existence. For example, one initiative provides 80 percent of qualifying costs or SGD600,000 (USD480,000), whichever is lower, to integrate water efficiency improvements into the early design stages of manufacturing facilities. The reasoning is that designing facilities to be water efficient from the ground up can reduce the capital cost of the system and generate long-term savings in resource use.

Singapore also offers the Innovation for Environment Sustainability (IES) Fund, managed by its National Environment Agency. This fund helps companies to implement environmental protection and public health related projects. The proposed projects must be at the applied research and test-bedding stage of technology development and help Singapore meet its goal of environmental sustainability. Water efficiency projects are eligible for these grants, which cover a portion of project costs, up to a maximum of SGD2 million (USD1.6 million) for a duration of 3 years.

Sub-national incentives

Innovative water-related tax and non-tax benefits are often available to businesses at sub-national and municipal levels.

For example, Canada's city of **Toronto** has a Capacity Buy Back Program offering cash rebates to commercial organizations that implement permanent process or equipment changes that save water. The one-time cash rebates are up to CAD0.30 (USD0.30) per liter of water saved per average day.

The US' Southern **California** WaterSmart Commercial Programs also offers rebates for water efficient fixtures and equipment.

[26] http://www.pub.gov.sg/general/Pages/WaterTariff.aspx. Accessed 21 March 2013.

Material resource efficiency & waste management

MATERIAL RESOURCE EFFICIENCY/ WASTE MANAGEMENT	
France	1
China	2
Belgium	3
South Korea	
UK	

Source: The KPMG Green Tax Index, 2013.

Taxes on waste to landfill have been common in Europe since the 1990s. Over the last two decades, governments around the world, both national and local, have become more innovative in using their tax codes and other fiscal instruments to conserve material resources, reduce waste (including packaging) and encourage the reuse and recycling of waste materials.

That said, however, tax approaches related to material resource conservation and waste reduction tend to be penalty-led. France, for example, leads the ranking in this category on the basis of several different penalties imposed on waste. China is unusual in that it imposes taxes on mineral resources.

Around one quarter (5) of the countries analyzed for this Index offer incentives for efficient use of materials or waste recycling as part of their national tax code. They are South Korea, China, Brazil, South Africa and the US. Notably, European countries appear to focus on penalties rather than incentives in this area.

France

France has the most penalties and no incentives in this space, and therefore scores most highly among the material resource Index scores (for the purposes of this Index, penalty scores are weighted by a factor of 2 to reflect the fact that compliance is obligatory).

France imposes a tax on the removal of refuse from buildings liable to property tax (except factories), a tax on the recovery and elimination of paper waste, and a tax on the recovery and elimination of electronic waste.

The tax on paper waste is paid by every organization that produces or imports more than five tons of printed paper. In 2013, the tax rate was EUR48 (USD62) per ton produced in 2012. In addition, every business that produces, imports or introduces electric and electronic equipment on the national market must contribute to the collection and the elimination of waste equipment.

China

Tax penalties enforced by revenue agencies on minerals are uncommon among the countries analyzed for this Index, although one of the most striking examples is the announcement by China in 2012 of increases in resource taxes on six minerals, including iron and tin ore. Reports attributed the increases to China's policy objective of conserving domestic mineral resources and the environment.

The Chinese government's levy on tin ore rose 20-fold to between CNY12 and CNY20 (USD1.95 to USD3.25) per ton depending on the grade. The tax on iron ore also rose from 60 percent of the iron ore base rate to 80 percent,[27] while similar increases were imposed on molybdenum, magnesium, talc and boron.

Various tax incentives are also available in China. For example, revenue derived from the manufacture of products that are in line with state industrial policy and involve "synergistic use of resources" may be reduced to 90 percent of actual in calculating the taxable income of enterprise.

In 2011, China reduced or eliminated VAT on goods produced from recycled materials in order to promote the circular economy. VAT refunds range between 50 and 100 percent. Qualifying goods include sand produced from construction waste, powdered rubber made from obsolete tires and electricity or heat produced from organic waste.[28]

Belgium

Belgium both penalizes and incentivizes behavior related to material resources and waste. Firstly, Belgium applies tax penalties to a wide range of material goods including beverage packaging, disposable cameras (unless 80 percent can be recycled), batteries and disposable cutlery. In addition, the country offers a 3 percent tax deduction for companies that acquire new tangible or intangible fixed assets that contribute to the recycling of packaging.

South Korea

A number of tax incentives are available in South Korea related to materials, packaging and waste. For example, a tax credit is available for mid-size companies that provide waste treatment or recycling services. The tax reduction is calculated as a percentage between 5 percent and 30 percent of the taxable income of the company pending on the type of service provided. This provision stops on 31 December 2014.

In addition, a business that purchases waste materials or used cars from a VAT-exempt entity (such as the government) and re-uses them in further manufacturing processes is entitled to recover a deemed input VAT.

UK

The UK imposes an aggregates levy, introduced on 1 April 2002, which is a UK-wide tax on the commercial exploitation of virgin aggregates, namely rock, sand and gravel. The levy aims to encourage efficient use of virgin aggregate materials and increased use of untaxed alternative construction materials such as recycled construction and demolition waste.

The UK also imposes a per-ton landfill tax on waste going to landfill.

Other material resource and waste penalties and incentives

Other notable tax instruments applicable to material resource conservation and waste reduction include **South Africa's** Section 37B of the Income Tax Act. This provides an allowance for costs incurred in acquiring new environmental treatment, recycling, or waste disposal assets.

[27] http://www.bloomberg.com/news/2012-02-17/china-raises-resources-tax-on-iron-tin-molybdenum-production.html. Accessed 21 March.
[28] http://www.china-briefing.com/news/2011/11/28/china-expands-tax-incentives-to-promote-circular-economy.html. Accessed 21 March.

For waste treatment and recycling assets, a capital allowance of 40 percent of the cost is available in year one and a further 20 percent per annum for the subsequent 3 years. For waste disposal assets, the cost can be written off in a straight line over 20 years at 5 percent per year.

In the **US**, corporations can benefit from accelerated depreciation of 50 percent of the adjusted basis of assets purchased for the reuse and recycling of waste materials.

The **Netherlands** abolished its Packaging Tax in 2013 in favor of a Packaging Waste Control Levy payable by companies that introduce more than 50,000 kilos of packaging onto the Dutch market.

In **Brazil** manufacturers benefit from a tax credit on the acquisition of certain waste materials if they are to be recycled into new products. Eligible waste materials include plastic, paper, glass and various metals. The tax credit is calculated according to a defined percentage of the IPI (federal sales tax) rate.

Landfill taxes are relatively common across the globe, on a national and sub-national level. As examples, **Finland** taxes EUR50 (USD65) per ton, **Japan** taxes per ton of industrial waste at a rate set by local governments, and Mexico City taxes commercial waste per kilogram in excess of 50kg.

Non-tax incentives

Various non-tax incentives and grants specific to material resources and waste are also available around the world.

For example, **Australia**'s Australian Packaging Covenant is an agreement between companies in the supply chain and all levels of the Australian government to reduce the environmental impacts of consumer packaging by encouraging improvements in packaging design, higher recycling rates and better stewardship of packaging. Grants are available to industry to focus on initiatives related to glass, plastics and recycling programs. Over AUD6.1 million (USD6.3 million) in funding has been provided to 40 new projects in the 2012-2013 fiscal year.

Sub-national initiatives

Mexico City provides an example of waste-reduction tax incentives offered by municipalities. Since 3 years ago, the city has granted a tax credit to corporations that recycle or reprocess their solid waste. The credits are offered on a sliding scale from 20 percent of payroll tax to those who recycle or reprocess from 33 percent to 44 percent of their waste, up to a credit of 40 percent of the payroll tax to those who recycle or reprocess between 60 and 100 percent of their solid waste.

"In the US, corporations can benefit from accelerated depreciation of 50 percent of the adjusted basis of assets purchased for the reuse and recycling of waste materials."

Pollution control & **ecosystem protection**

POLLUTION CONTROL & ECOSYSTEM PROTECTION	
Singapore	1
Spain	2
France, Mexico	3
South Africa, UK, US	

Source: The KPMG Green Tax Index, 2013.

This section of the KPMG Green Tax Index reviews how national governments are using their tax systems to penalize polluting activities or to incentivize the reduction of pollution or the protection of ecosystems.

It is important to note that many countries have environmental agencies that monitor the impact of industry on the environment, issue licenses and impose fines for contraventions. The Index does not consider such fines for its purposes, but limits its review specifically to *tax-based* penalties and incentives.

Nine of the 21 countries analyzed are notable for having some form of tax instruments in place related to pollution control and ecosystem protection. Over half of these countries are located in Europe. Most of the tax mechanisms these governments have in place are incentives to encourage the purchase of equipment to reduce pollution or incentives to encourage businesses to rehabilitate contaminated land.

However, France stands out for enacting tax-based penalties on pollution.

Singapore

Singapore has two significant tax incentives that relate to ecosystem conservation. In 2010, Singapore introduced the Land Intensification Allowance (LIA) incentive, a scheme to promote more efficient use of industrial land, encouraging brownfield rather than greenfield development. The LIA provides an initial tax allowance of 25 percent and annual tax allowance of 5 percent on qualifying capital expenditure on the construction, renovation or extension of industrial buildings.

Businesses in Singapore can also claim a one-year accelerated capital allowance for approved pollution control equipment.

Spain

Spain offers a Corporate Income Tax credit (Article 39) for investments in fixed assets whose purpose is to protect the environment. Qualifying assets include facilities to avoid air, noise or water pollution from industrial installations. The tax credit amount is 8 percent of qualifying investments.

"Nine of the 21 countries analyzed are notable for having some form of tax instruments in place related to pollution control and ecosystem protection."

France

France imposes a general tax on polluting activities (*Taxe Générale sur les Activités Polluantes* or TGAP) on a "pay as you pollute" basis. The original tax, enacted in 1999, covered the disposal of waste, atmospheric industrial pollution and air traffic noise. It was extended in 2000 to cover washing products and insecticide products for agricultural use, among others. As from 1 January 2014 the tax will apply to single-use bags provided in stores. The tax is levied per ton of polluting substance produced or processed.

Mexico

Investments in equipment to control or prevent environmental pollution can qualify for an immediate 100 percent deduction.

South Africa

South Africa has a sector specific tax incentive for the mining sector. Mining companies are obligated to rehabilitate land after the conclusion of mining activities and must set up a trust to fund the rehabilitation. Contributions to these trusts are fully tax deductible.

UK

In the UK, companies can claim Land Remediation Relief: a deduction of 100 percent, plus an additional deduction of 50 percent, for qualifying expenditure incurred by companies in rehabilitating land acquired from a third party in a contaminated state.

US

US companies can choose to write off certain certified pollution control assets over a period of time, between 60 and 84 months depending on the type of facility. This allowance is one of the few incentives in the US tax code with no expiration date, however facilities must be certified in order to take advantage of the incentive.

In the US, there are also a large number of sub-national state-based tax incentives related to pollution control and ecosystem protection. For example, North Carolina's Conservation Tax Credit Program is an incentive for private landowners, including corporations, to voluntarily donate land for conservation. The tax credit is equal to 25 percent of the fair market value of the property donated and limited to USD500,000 for corporations.

Non-tax incentives

Singapore's IES Fund provides funding of SGD2 million (USD1.6 million) per project to qualifying Singaporean companies that undertake environmental protection and public health related projects that contribute to the long-term environmental sustainability of Singapore. Focus areas for the fund include pollution control solutions for air, water, noise, hazardous substances and toxic industrial waste.

About
KPMG's green tax services

KPMG's global team of sustainability tax professionals help companies – and especially multinationals – to identify, quantify and capture green tax credits and incentives specific to their investments and activities.

These incentives can be worth tens of millions of dollars. Capturing them can help companies to increase the return on investments in sustainability projects and innovation, lower effective tax rates and improve cash flow.

KPMG member firms also assist their clients to manage and reduce their exposure to green tax penalties, such as carbon taxes, which can have a material impact on a company's bottom line.

KPMG in the US assisted a multinational consumer products company to plan its investment in a new R&D facility. The team identified green tax opportunities worth approximately US$30 million including energy credits, R&D tax deductions and credits, fixed asset allowances and other incentives.

KPMG in South Africa assisted a client to apply for a tax allowance for a bio-diesel manufacturing plant. The project was approved by South Africa's Department of Trade & Industry as a Greenfield project with preferred status. The net tax benefit to the client was ZAR252 million (US$28.5 million).

KPMG in the US conducted a review of energy efficient data centers and production facilities for a large software company. Approximately US$40 million green tax opportunities were identified including tax deductions for energy-efficient buildings, and R&D deductions and credits.

KPMG's green tax services include, but are not limited to:

Identifying Tax Incentives and Grants: Advising on the availability of tax credits, deductions, grants and other incentives relevant to green investments including renewable energy, green innovation, building improvements, and energy and resource efficiency.

Sustainability Studies: Advising on the after-tax effects of green tax incentives on corporate sustainability investments, for example on investments to improve the energy efficiency of manufacturing processes.

Tax Advice: Assisting clients to prepare tax opinions, providing due diligence services, undertaking risk assessments, reviewing financial models and providing related general income tax advice.

Transaction Structuring: Assisting clients to structure transactions to help secure relevant green tax incentives, for example through partnerships or sale-leasebacks.

Monitoring Legislation: Monitoring new green tax legislation worldwide and educating clients on the latest incentive opportunities and penalty compliance obligations.

Managing green tax penalties: Assisting clients with the monitoring and reporting required to comply with green tax penalties such as carbon taxes and price mechanisms and helping them to reduce exposure to penalties, for example by reducing energy use and carbon emissions.

Contact your local member firm professional

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