

STRUCTURAL POLICY
COUNTRY NOTES

Thailand



Thailand

A. Medium-term economic outlook (forecast, 2013-17 average)

GDP growth (percentage change):	5.1
Current account balance (% of GDP):	0.8
Fiscal balance (% of GDP):	-2.6

B. Medium-term plan

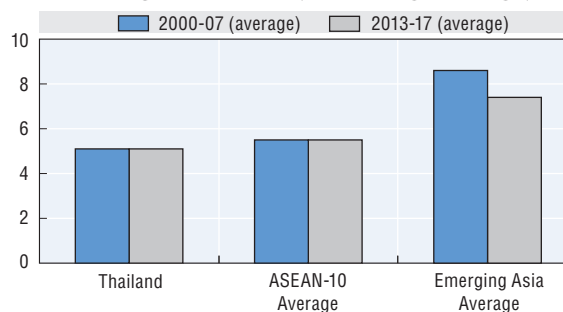
Period:	2012-16
Theme:	Philosophy of Sufficiency Economy

C. Basic data (in 2011)

Total population:	64 million
Population of Bangkok:	8.3 million (in 2010)
GDP per capita at PPP:	9 396 (current USD)

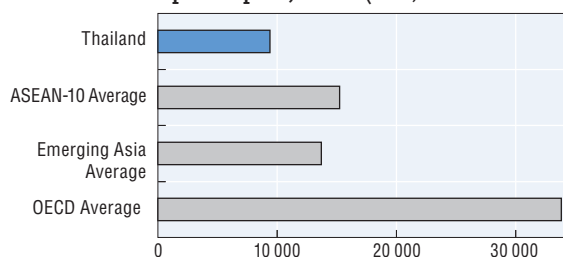
Sources: OECD Development Centre, MPF-2013, national sources and IMF.

GDP growth rates (percentage change)



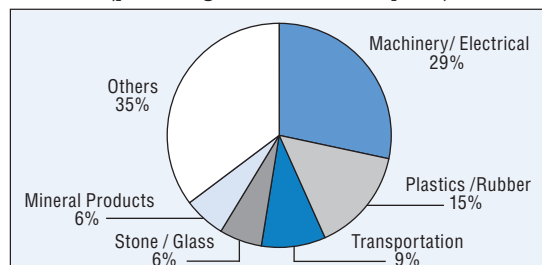
Source: OECD Development Centre, MPF-2013.

GDP per capita, 2011 (PPP, current USD)



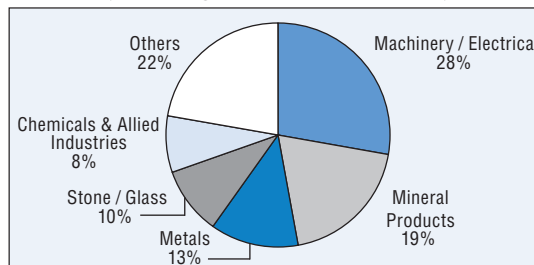
Source: IMF and national sources.

Composition of exports in 2011 (percentage share of total exports)



Source: Trademap.

Composition of imports in 2011 (percentage share of total imports)



Thailand faces challenges to further improve its education and health-care systems while addressing the accumulated environmental damage from its rapid growth. The country has made impressive progress in providing education and health care to most of the population. However significant disparities in access remain, especially for poorer households and between rural and urban areas that need to be addressed. Education quality needs to be improved, particularly the quality of teachers, and rising health-care costs need to be contained through reforms to improve efficiency in the delivery of services.

Thailand also needs to address environmental damage from past growth and achieve greener growth in the future by reducing carbon emissions and other forms of pollution. This will require commitment to greener growth by government, business and the public and new policies, including increased use of fiscal incentives to encourage more environmentally friendly activities and behaviour.

Thailand's medium-term policy challenges and responses

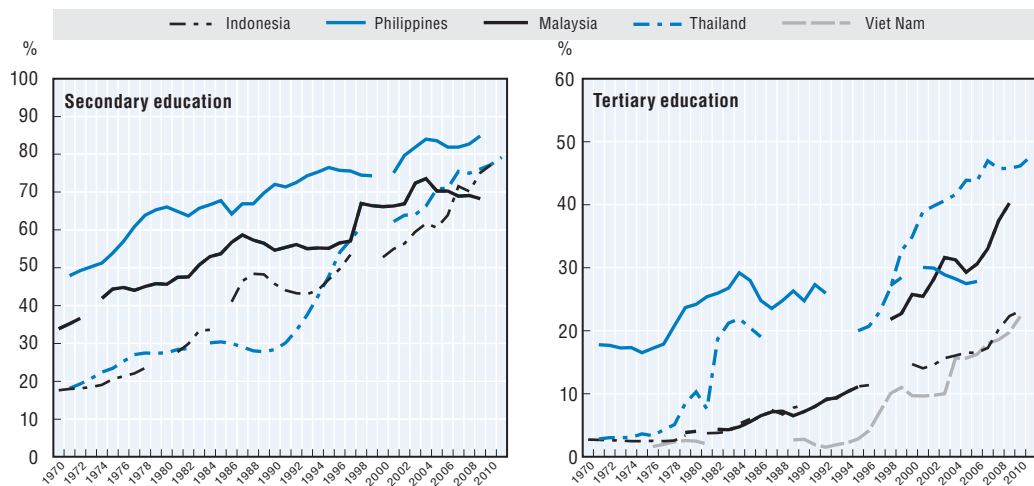
- Raise the quality of education and reduce disparities
- Achieve a more equitable health-care system
- Foster green growth through investment and fiscal reform

POLICY FOCUS

Raise the quality of education and reduce disparities

Thailand has successfully addressed much of its problem of low access to education that existed before the 1990s by increasing education enrolment rates at almost every education level (see Figure 2.6.1). Indeed, the tertiary enrolment rate in Thailand is now among the highest in ASEAN.

Figure 2.6.1. Gross school enrolment rate in Thailand and other Southeast Asian countries




Source: UNESCO Education Statistics.

StatLink  <http://dx.doi.org/10.1787/888932774547>

Access is still more unequal and quality lower than is desirable

A closer look at participation in the education system reveals one of the key current problems with Thai education (see Table 2.6.1 for a brief description of Thai education system): the unequal education chances for the poor. Figure 2.6.2 shows that the gaps in college enrolment rates between the rich (highest quartile) and the three lower quartiles of the income distribution, and especially with the lowest quartile, have widened greatly. This has happened despite the government's active policy to foster education loans for poor college students.

Table 2.6.1. Thai education system

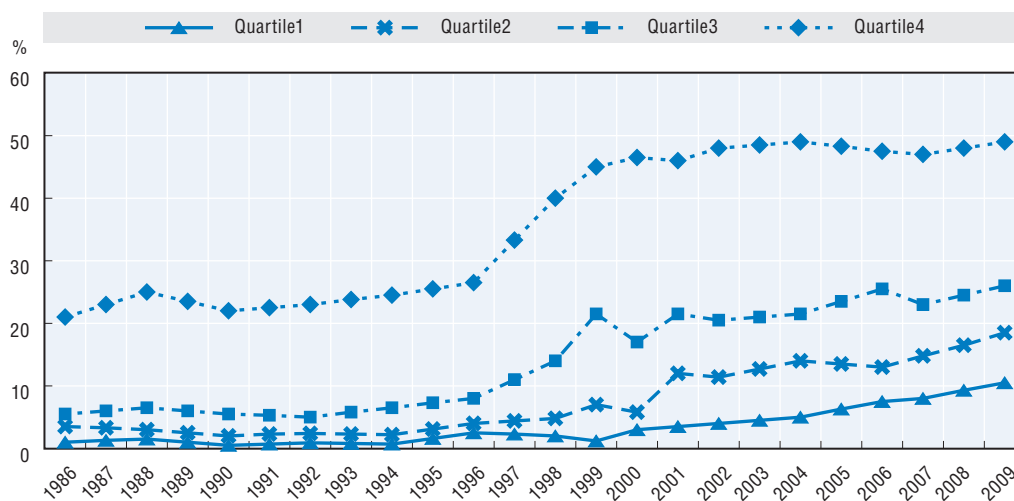
Approximate age	Grade	Level of education	Vocational education	Free education
3				
4		Pre-elementary		
5				
6	1	Primary		
7	2			
8	3			
9	4			
10	5			
11	6			
12	7	Lower-secondary		
13	8			
14	9			
15	10	Upper-secondary	Lower vocational and technical	
16	11			
17	12			
18	13	Undergraduate	Tertiary vocational	
19	14			
20	15			
21	16			

Note: Thai education is a -6-3-3 system for basic education and normally 4 years at the tertiary level. The first 9 years of basic education are compulsory. The government subsidises the 3 years of pre-elementary level education as well.

Source: Adapted from Ministry of Education.

The implication is that addressing short-term financial constraints is not enough to eliminate inequalities in education and that other interventions must be made much earlier. To this end, the 15-year free education policy introduced in 2009 is a good step toward a solution. Unfortunately, many students living in poverty still cannot attend schools, owing to financial difficulties other than the direct cost of school enrolment. For example, beside tuition fees, transportation cost, which is not covered by the new policy, is a major cost of attending school, especially for poor students living far away from the schools. Students of public schools, who tend to come from low or middle income families, have to pay transportation costs averaging THB 3 500 (Thai baht) per year per student in 2009 (see Table 2.6.2), which is equivalent to 6% of the annual rural poverty line income for a family of 3.5 persons. This cost represents a significant burden for poor families and could lead them to keep their children out of school to avoid the cost. Drop-out rates, although not too high overall, remain an issue in particular, at secondary school in Thailand (see Table 2.6.3).

Figure 2.6.2. Trends in college enrolment rates for 19-25 year-olds in Thailand, by income quartile



Source: Lathapipat, Dilaka (2011), "The Inequality of Access to Education in Thailand, 1986–2009", paper presented at the conference ANU-DBU Economics of Education Policy: Access and Equity at Dhurakij Pundit University, Bangkok, Thailand, 14–16 June 2011.


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Table 2.6.2. Household education expenditure in Thailand, by education levels and school type, 2009
(average THB per head per year)

	Private School				Public School			
	Tuition Fees	Uniform	Books and equipment	Transport	Tuition Fees	Uniform	Books and equipment	Transport
Pre-primary	8 703	980	823	3 612	1 546	708	456	2 317
Primary	11 031	1 315	1 454	4 794	1 976	880	761	2 837
Lower Secondary	10 894	1 507	1 600	5 022	2 562	1 139	1 122	3 580
Upper Secondary	23 643	1 430	1 809	5 898	4 615	1 238	1 416	3 927
Vocational	12 604	1 770	2 303	6 578	4 565	1 443	1 528	4 645
Tertiary	37 683	1 978	3 346	8 510	14 461	1 636	2 459	6 231
Informal Education	2 426	692	559	2 418	-	-	-	-
Total	13 824	1 272	1 500	5 052	5 120	970	973	3 533

Source: OECD Development Centre's calculation based on Socio-Economic Survey (SES) data and National Statistical Office (NSO).

Table 2.6.3. Drop-out rates among students in basic education in Thailand, 2010

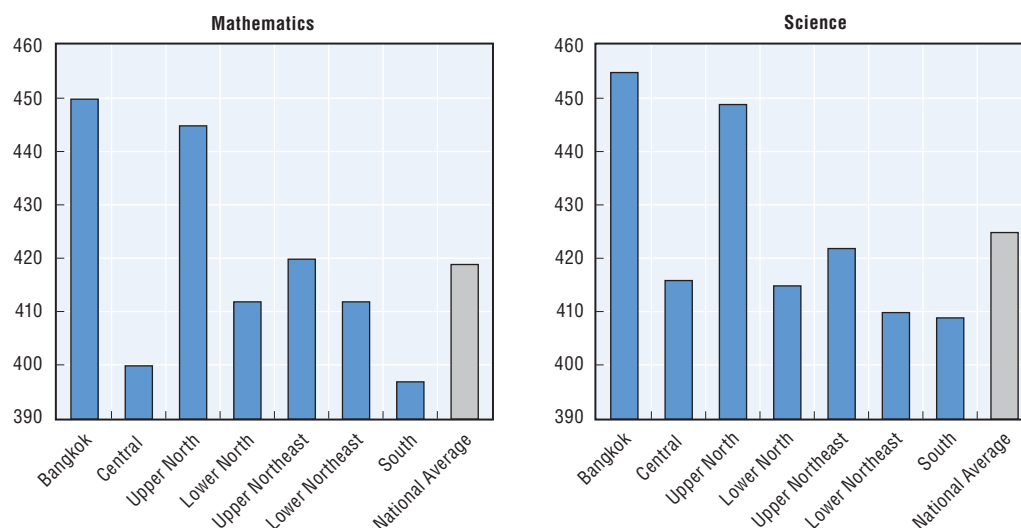
Grade	Enrolment in initial academic year 2007 (persons)	No. of drop-outs (persons)	Drop-out rate (%)
Grand Total	6 850 181	47 809	0.70
Grade 1	595 814	1 653	0.28
Grade 2	573 858	1 213	0.21
Grade 3	592 525	1 033	0.17
Grade 4	600 484	1 000	0.17
Grade 5	614 904	1 502	0.24
Grade 6	674 028	2 071	0.31
Total Primary	3 651 613	8 472	0.23
Grade 7	756 824	8 115	1.07
Grade 8	726 893	9 971	1.37
Grade 9	688 570	10 439	1.52
Total Lower Secondary	2 172 287	28 525	1.31
Grade 10	380 478	5 710	1.50
Grade 11	332 168	3 192	0.96
Grade 12	313 635	1 910	0.61
Total Upper Secondary	1 026 218	10 812	1.05

Source: Educational Statistics from the Office of Basic Education Commission, 2010.

An even more important challenge is education quality, both its overall level and the distribution of higher-quality education. High quality education contributes to students' performance both in schools and later in the labour market. Students' cognitive skills, as measured by appropriate tests, have been found to determine individual earnings, the distribution of income, and thereby influence overall economic growth (Hanushek, 2011). Hanushek (2011) also points out that while both basic skills and advanced skills are important for developing countries, advanced skills matter more in helping a country to escape the middle-income trap.

Research finds that school quality matters and can explain performance differentials between students in urban and rural areas in Thailand (Lounkaew (2011)). A recent assessment by the Office for National Education Standards and Quality Assessment (ONESQA) reveals that about 3 243 out of 15 515 schools assessed did not pass minimum quality requirements (ONESQA, 2008), and that the majority of low-performing schools were in rural areas. The latest Programme for International Student Assessment (PISA) test also reveals similar results, with students in small-size schools or in remote areas getting much lower scores than those in cities (Figure 2.6.3). Unfortunately, there has so far been only little effort made to narrow the quality gaps among schools, and those efforts that have been taken have not yielded much success. Low quality schools have been asked to improve themselves, but without much tangible financial or non-financial help from the government. Worse, there have been attempts to lower standards so that more schools can pass without any real improvements (TDRI, 2012).

Figure 2.6.3. PISA scores in Thailand, by subject and region
(score)



Note: PISA scale was set such that approximately two-thirds of students across OECD countries score between 400 and 600 points. Gaps of 72, 62 and 75 points in reading, mathematics and science scores, respectively, are equivalent to one proficiency level.

Source: The Institute for the Promotion of Teaching Science and Technology (IPST).

StatLink  <http://dx.doi.org/10.1787/888932774585>

Teacher quality needs to be improved

Teacher quality is also an important factor in school quality. A recent study confirms this proposition (Lathapipat, 2011). Singapore and Finland are often cited as success case studies in this respect. They have had different patterns of economic development, but both have achieved successful outcomes. Good institutions and incentive structures are key policy levers for sustaining high quality teaching. These levers include encouraging competition and accountability (for example, through central exit exams) and expanding choice for students and their parents (for example, by increasing the quality of private schools). A quality tracking system and performance-based teachers' salaries are important ingredients.

Recent studies suggest that the most important management reform to enhance education quality is to establish a solid accountability system at all levels of education management: teachers, school management, district education units, ministry executives, the education minister and finally the prime minister.

In recognition of the need for improvement, the government of Thailand has established quality improvement as the focus of the second phase of the education reform programme, which was approved in August 2009. Box 2.6.1 gives examples of measures to enhance teacher quality. Various funds and mechanisms will also be introduced to support the teaching profession. At the same time, higher skills and vocational training will be highlighted. As for the poor and the underprivileged, the 15-year free education programme will be reinforced with provision of greater and fairer educational opportunities and quality.

Box 2.6.1. The Thai Government's plan to enhance teacher quality

On 8 December 2009, Thailand's cabinet approved, a five-year (2010-15) "New Breed of Teachers Project" Pongwat (2012). The main leaders of the project are the Ministry of Education's Basic and Vocational Education Commissions. In five years' time, the project aims to produce 30 000 teachers, especially in scarce and most-needed subject areas. The project comprises two components. First, the regular five-year teacher training programmes at state universities' faculties of education are to enrol qualified high school graduates or third-year students of the Lower Vocational Certificate Programme. Second, the 4+1 programme takes in graduates from undergraduate schools with degrees in areas deemed scarce and greatly needed, notably science and mathematics, who are interested in becoming school teachers. Student teachers in the programme must maintain rigorous academic standards. Successful graduates of the programme are not required to take competitive examinations for teaching positions, as is normally the case for other candidates, and they generally have little difficulty in finding jobs. If this and other related programmes are successful, basic and vocational schools should soon benefit from the infusion of the first group of the "New Breed of Teachers". This 'new breed' is expected to make a real difference, qualitatively speaking, in the nation's classrooms, schools, colleges and in the entire educational system. More importantly, prospective "new-breed" teachers will have to pay serious attention to "knowledge-based" education, which is the key to improving the overall quality of education in Thailand and also crucial for further self-directed and lifelong learning.

Further reforms are needed in several areas

Highest priority should be put on narrowing the gap in school quality and teacher quality between urban and rural areas. For example, smaller schools and schools in remote areas should receive a greater allocation from the national education budget than their size would otherwise imply.

Education reform should not focus mainly on increasing the education budget, but more on improving education management, especially in establishing a sound and comprehensive accountability system. Rewards to teachers and management should be linked directly to students' performance, which should be measured as objectively as possible and without compromise of standards.

Teacher quality needs urgent improvement, through better incentives and evaluation processes.

POLICY FOCUS

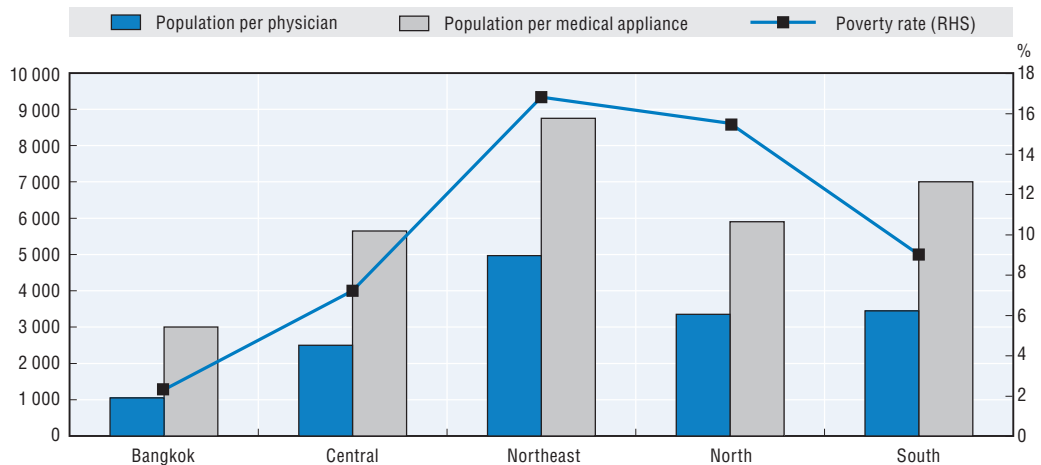
Achieve a more equitable health-care system

The Thai health system has developed relatively well since 2000. This development reflects the universal coverage of the health insurance and health protection systems within a manageable cost. The quality of service has also been improving, to the point that the perceived quality difference between services under the social security health scheme (SSS) and under the universal health care (UC) have narrowed rapidly. This narrowing is important because most of the country's poor are registered with the UC.

Health-care access is unevenly distributed

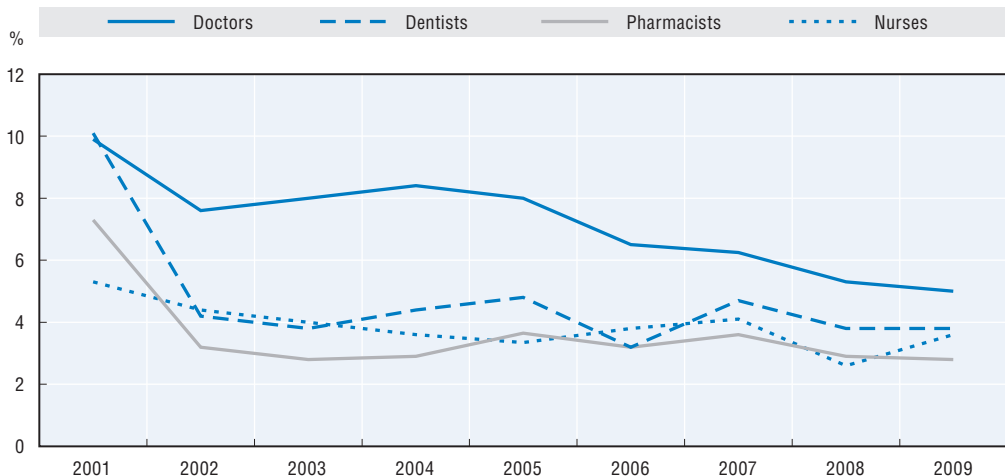
One key remaining area of concern is the distribution of health services across regions. Residents of Bangkok have much greater access to medical services, as measured by the number of physicians and the number of medical appliances per person, than residents of other regions of the country (Figure 2.6.4). By the same measure, poor people in urban areas have less access to medical services than better-off urban residents. As a result, poor people are more vulnerable to receiving inadequate medical care.

Figure 2.6.4. Access to health services and poverty rates in Thailand, by region, 2010



Source: Ministry of Health, Thailand Development Research Institute (TDRI) (2012), "Revamping Thai Education System: Quality for All", paper presented at the TDRI Year-End Conference 2012, February.
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Figure 2.6.5. Difference in the ratio of health personnel per capita between Bangkok and Northeast Thailand

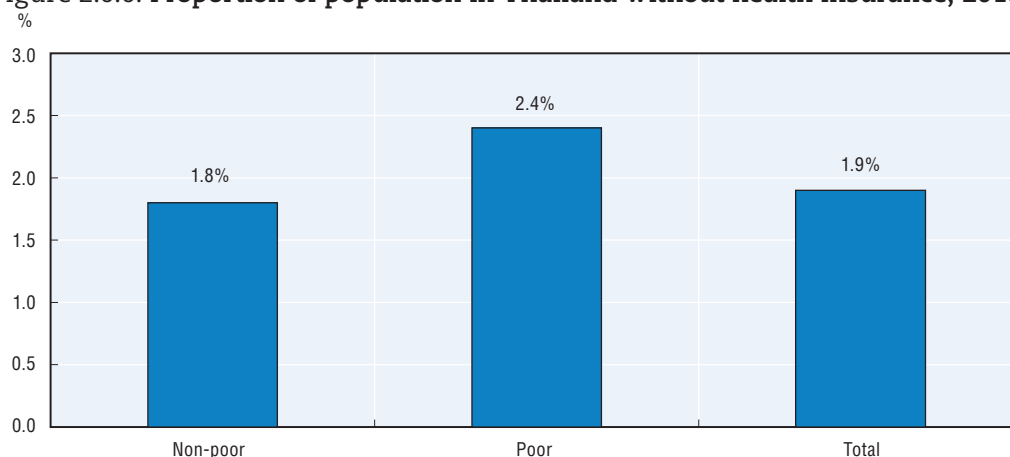



Source: Author's calculation using data from Ministry of Health's website.
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The situation has improved over time as the differential availability of medical personnel between the most abundant area (Bangkok) and the scarcest area (the Northeast) has become smaller (Figure 2.6.5). This is probably due to the introduction of the UC. But this improvement on the medical supply side has not provided all of the population with adequate access to medical care. Figure 2.6.6 shows that a small fraction of the population reports not having any health insurance and that the lack was more likely to occur among those who were poor.

There are many reasons for the lack of health insurance for some people in Thailand. Some uninsured, including some born in Thailand and to Thai parents, may lack documents needed to prove their citizenship. Other uninsured are foreign residents of Thailand (such as low-skilled foreign workers) to whom the government has only recently begun to provide health services and who sometimes have to pay fees for their insurance and are still far from getting full coverage. The uninsured may also include small numbers of Thai citizens who are not aware of their right to free health insurance

Figure 2.6.6. Proportion of population in Thailand without health insurance, 2010

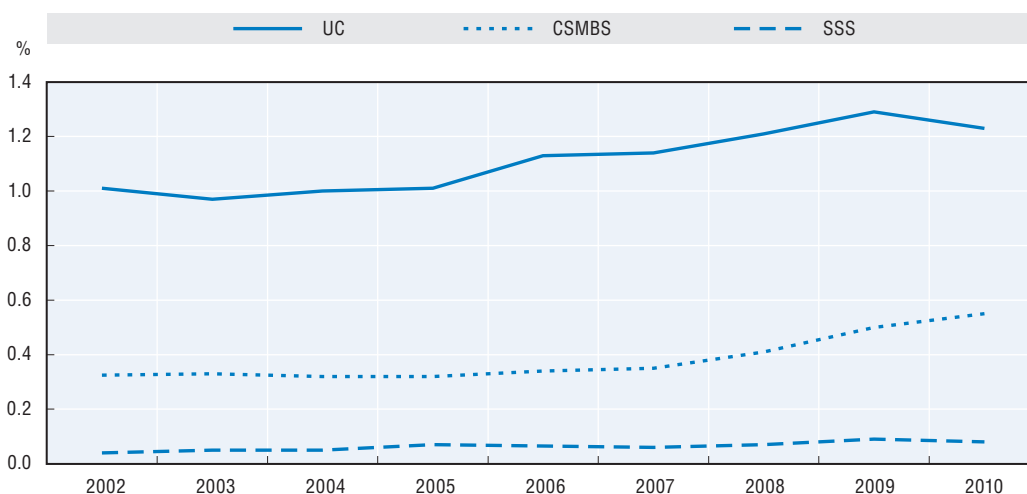


Source: Calculated from the socio-economic survey, 2010, National Statistical Office.
StatLink  <http://dx.doi.org/10.1787/888932774642>


Financing reforms will also be required to improve access and quality

Narrowing the gap in access to health services will require more financing, which remains a cause for concern. Figure 2.6.7 indicates that health costs paid by the government have increased in relation to GDP over the past five years. The biggest cost is the UC, which accounts for around 65-72% of total fiscal outlays for health care. Most worrisome is the increase in health-care costs for civil servants, who are covered under the Civil Servant Medical Benefit Scheme (CSMBS). This cost commands an increasing share of government outlays on health care. The main cause is the increased use of expensive medications. Recent attempts to control the cost of the CSMBS have had at best marginal success. In this regard, OECD lessons might be helpful, such as the “pay for performance system” used in a number of OECD countries (Box 2.6.2).

Figure 2.6.7. Fiscal cost of the main health insurance schemes in Thailand
(percentage of GDP)



Source: National Health Account.

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Another health inequality issue concerns care for the dependent elderly, who are those older persons who require constant care because of their fragile health status. The dependent elderly are estimated to be around 3.6% of all the elderly. As Thai society ages, the numbers of these dependent elderly will increase rapidly. The total cost for caring for them (both medical and non-medical care) is estimated to be around 2.4% of total public medical expenses. Currently, this cost is borne mostly by families. This cost can put a great financial burden on the families, especially poor ones, as it can be as high as 2.5 times the poverty line. It is expected that the government will eventually have to bear these costs, which will put more pressure on the overall government budget for health.

Box 2.6.2. Pay for performance systems in healthcare provision: Lessons from OECD countries

Many OECD countries provide public health-care services. However, fiscal constraints and unsatisfied health-care needs have forced governments to focus on how to reduce health-care spending while enhancing the efficiency and effectiveness of the services provided. This has led some countries to experiment with new methods of paying health-care providers and, sometimes, patients, based more on the outcomes than in the traditional fee-for-service payment model, an approach known as pay for performance (P4P).

Supply-side policies to increase cost efficiency have shown positive results. Under P4P, health-care providers receive a payment based on quality of services provided and cost savings. The **United States** began to experiment with such a system, The Physician Group Practice (PGP) Demonstration, in 2005. For each PGP, Medicare savings from the Demonstration are calculated by comparing actual spending to a target. The PGP is eligible to receive 80% of the savings that are above a given threshold. Two out of ten physician groups had at least 2% lower Medicare spending growth rates as compared to control groups.

Box 2.6.2. (contd.)

The largest P4P scheme in the world is the Quality and Outcomes Framework (QOF) begun in the **United Kingdom** in 2004. The objective of the QOF is to reward service providers for how well they care for patients and not just how many patients they have on their list. The QOF covers four main areas: clinical practice, organisation, patient experience and additional services. Indicators for each area define the specific process or outcome that practices participating in the QOF are asked to achieve for their patients. There is some evidence that the programme has improved quality outcomes.

Demand-side policies give patients financial incentives to improve the quality of health care. This helps patients to prevent disease proactively and reduces the abuse of free medical care resources. The **Australian** Government provides incentives for child patients. This includes the Maternity Immunisation Allowance.

Penalties as well as rewards are indispensable. In 2007, **Korea** launched the Value Incentive Programme covering 43 tertiary hospitals providing secondary care services. High performers and performance improvers received bonuses amounting to 1% of reimbursements from the National Health Insurance Corporation (totalling USD 375 million) while performers below the 2007 baseline were penalised 1% of payments. The programme brought about a decrease in the variation of quality among providers and a marked improvement in the lowest performing group.

Source: OECD (2010c).

Awareness needs to be increased and costs better controlled and shared

Strengthening and where necessary modification of current reforms are needed to achieve greater access to health-care services in a more cost-effective manner. The government should attempt to improve awareness among the public, especially the poor and underprivileged, about the existence of the health insurance system and its services. The registration system for foreign workers needs to be improved so that they can get access to health services at an affordable fee. Cost control of CSMBS should be more strenuous so that the overall fiscal health cost is manageable and more resources become available for reducing disparities in access to health services. The cost of care for the dependent elderly, especially for those in poorer households, should be gradually transferred to the government.

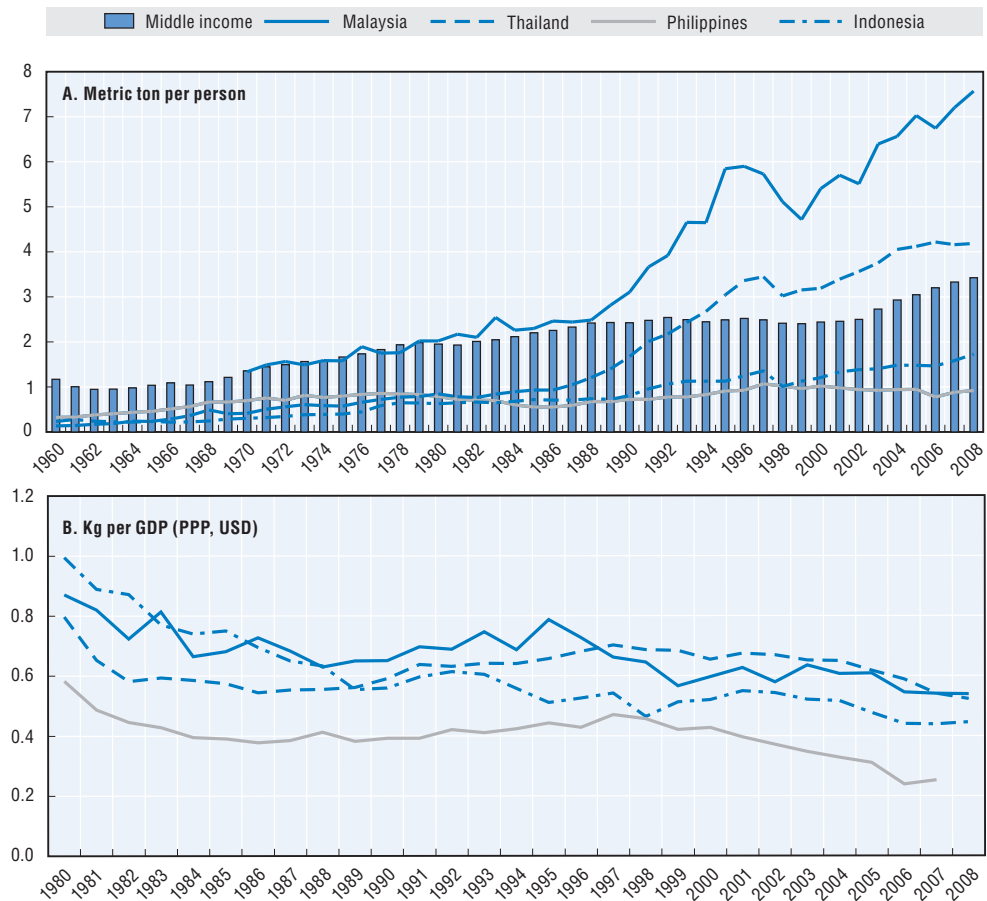
POLICY FOCUS

Foster green growth through investment and fiscal reform


During the past decades, the economic development model of Thailand can be characterised as “grow first, clean later”. This is clear from the increase in CO² emissions over the past 50 years. Figure 2.6.8A shows that Thailand’s CO² emission level increased constantly and rapidly, especially after the mid-1980s, and surpassed the average level among middle-income countries after the early 1990s. Although the rise in emissions is partly explained by the country’s development and increasing per-capita income, Thailand’s CO² emissions are noticeably higher than those of some other Southeast Asian countries at a comparable development level, such as Indonesia and the Philippines. As indicated in Figure 2.6.8B, Thailand as well as Malaysia emits more CO² per dollar of GDP than either Indonesia or the Philippines.

The comparatively high CO₂ emission per GDP of Thailand and Malaysia lead one to look for common characteristics of the two countries.

Figure 2.6.8. CO₂ emission in Thailand and other Southeast Asian countries



Source: World Development Indicator database, 2012.

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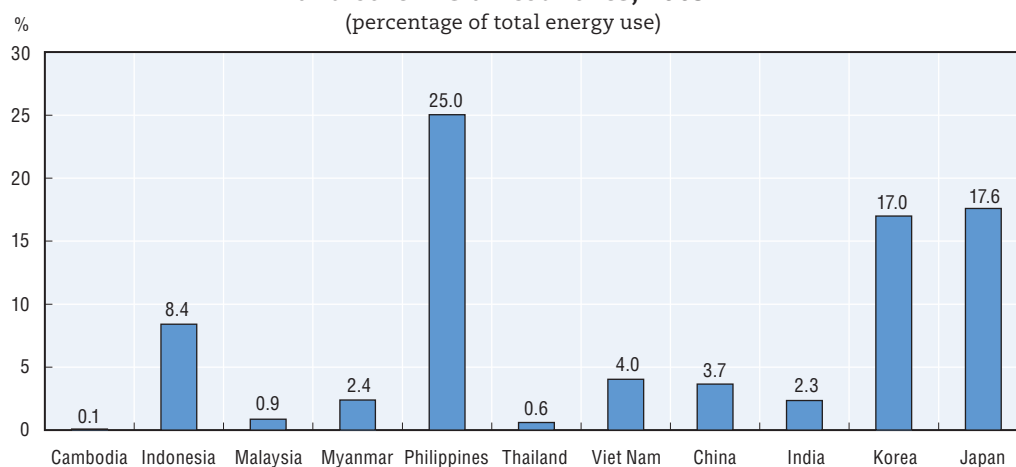
Greener growth has now become imperative

It is clear from these trends that Thailand should rethink its future development and move toward a green growth model, one emphasising greater balance between economic growth and environmental sustainability. Lately, countries have begun to view the green growth model as a new way to generate economic growth. The challenge is to achieve sufficiently high economic growth (to avoid falling into the middle-income trap) while making improving the environmental consequences of growth.

One means to achieve greener growth is to invest more in 'green technology', which would not only promote economic growth domestically but is potentially a good source of export revenue when the technology becomes mature and saleable. Thailand is not at that stage yet, but it should be aiming in that direction. There are many areas in green technology that Thailand has natural comparative advantages, such as solar energy, bio-energy, and organic agriculture. A proactive policy to develop these technologies would in the long term put the country in the forefront of new green products.

Green growth will also make Thailand more resilient to energy shocks. At present the country depends too much on energy from fossil fuels and too little on alternative energy sources. As shown in Figure 2.6.9, alternative energy usage in Thailand is among the lowest in Asia. This is in spite of the recent progress in the promotion of bio-energy (such as compressed natural gas, biogas, bio-diesel and bio-ethanol) in the transportation sector. This dependence on fossil fuels has been a major contributor to the country's high CO₂ emissions.

Figure 2.6.9. Use of alternative and nuclear energy in Thailand and other Asian countries, 2009



Source: World Development Indicator database, 2012.
 StatLink  <http://dx.doi.org/10.1787/888932774699>

Promising initiatives are being undertaken but more will need to be done

Two significant policy initiatives concerning green growth have recently been taken by Thailand. The first is the launch of the 11th National and Social Development Plan, which puts special emphasis on green growth. The plan consists of “four pillars” for promoting low-carbon growth for Thailand: i) adjustment of the country's economic structure for less energy- and carbon-intensive economic growth; ii) development of low-carbon cities; iii) achievement of high energy efficiency and widespread diffusion of low-carbon technologies; and iv) encouragement of resource-efficient and sustainable lifestyles. Since the 11th plan has just begun, it is not yet possible to evaluate its achievements.

The second initiative is a new environmental law – the ‘Environment Fiscal Act’ – now being drafted by the Ministry of Finance. The draft law is consistent with suggestions made in the SAEO 2011/12 to use fiscal tools to provide incentives for greener economic activities and behaviours. The draft act consists of six fiscal measures, ranging from taxes on consumption and production of goods and services that generate pollution, fees for environmental management, the trading of rights to emit pollutants and subsidies for environmentally friendly products and activities. However, the draft act will require much time for consultation.

Other measures to limit carbon emissions have been proposed and some already have been implemented. (Box 2.6.3). Of special interest are the tax and subsidy measures administered by the Board of Investment (BOI). The current approach embodied in the BOI measures is to reward firms that promise to limit pollution from their production activities, without penalising firms that are relatively heavy polluters.

Box 2.6.3. Carbon emission reduction measures being taken in Thailand

Tax incentives through the Board of Investment (BOI)

The BOI has granted duty-free import of machinery and an eight-year corporate income tax holiday to enterprises engaged in energy conservation, production of renewable energy and production of environmentally friendly products. The tax preferences include a 50% reduction of the corporate income tax on net profit for five years after the expiry of the tax holiday, that is during the 9th to the 13th year; as well as a deduction from net profit of the costs associated with facility installation and construction costs (not to exceed 25% of investment capital) in addition to the deduction for depreciation.

Investment grants through the Ministry of Energy

Investors can apply to the Ministry of Energy for investment grants for design and consultant fees and a portion of the investment cost to support three types of renewable energy projects, namely biogas projects, municipal waste projects and solar hot water projects. The maximum amount of the investment grant is around 10% to 30% of the cost for biogas, 25% to 100% for municipal waste and 30% for solar hot water, with a maximum cap of THB 50 million per project.

Energy Soft Loan through the Energy Efficiency Revolving Fund and the ESCO Fund

The Energy Efficiency Revolving Fund and the Energy Service Company (ESCO) Fund are the two featured funds under the ENCON Fund.

The Energy Efficiency Revolving Fund provides credit lines to 11 participating Thai banks at a zero interest rate. The requirements stipulated by the Revolving Fund are that the interest rate charged to borrowers be no more than 4%, with a maximum repayment period of no more than seven years and maximum loan size of THB 50 million. In cases where a project requires finance of over THB 50 million, the commercial banks will also provide their own funds to cover the remaining amount. It is important to note that the loan repayment flows back to the ENCON Fund and not to the Revolving Fund. During 2003-10, the Energy Efficiency Revolving Fund has supported over 335 energy efficiency projects and 112 renewable energy projects, with the estimated total energy saving of over USD 154 million per year and an average payback period of approximately three years (World Bank and NESDB, 2011, p.78).

Feed-in tariff

Thailand's Department of Alternative Energy Development and Efficiency (DEDE) has implemented a system of feed-in tariffs, with the objective of promoting private investment in renewable energy, to provide an incentive to small and very small power producers (10MW to 90MW and under 10MWH respectively) to enhance the commercial viability of their renewable energy projects.

Source: Anuchitworawong et al. (2012).

Without further measures, it is difficult for Thailand to be able to “clean-up” its high-polluting economy, which is partly the result of the BOI’s past promotion of FDI without sufficient regard to environmental consequences. Achievement of greener growth will require recognition by government, business and the public that Thailand is still far away from becoming a sufficiently green economy and that strenuous efforts must be taken by all elements of society to remedy the situation. A comprehensive set of steps needs to be developed and implemented to clean up the effects of past pollution. To provide long-needed incentives for more environmentally friendly growth, the draft environmental fiscal act needs to be completed and enacted into law as soon as possible.

Box 2.6.4. Environmentally related taxes: Examples from the OECD

Green growth means the fostering of economic growth and development while ensuring that the environment and other natural resources continue to provide the benefits on which national well-being depends. However, there is no “one-size-fits-all” prescription for green growth that is suitable in all cases because the policies that need to be implemented depend on national circumstances, such as a country’s stage of development, its institutions and its resource endowments. However, environmentally related taxes, which put a price on pollution or on the exploitation of natural resources, have been playing a central role in promoting green growth in many countries. Environment-related taxes provide clear and sustained incentives for businesses to invest and innovate for reduction of environmental damage, but also for households to reduce their energy consumption or to increase their recycling of materials. There are several OECD country examples illustrating the use of tax instruments that can promote green growth.

In **Turkey**, fuel taxes have significantly been increased over the last decade. The tax rate on petrol is higher than the taxes on diesel or liquefied petroleum gas (LPG). Lower tax rates on LPG have provided an incentive for consumers to shift towards LPG-fuelled vehicles. The number of LPG-fuelled cars increased from 800 000 to over 1.8 million between 2003 and 2007. Also, diesel consumption has increased while petrol consumption has remained quite flat.

In **Sweden**, the tax on NOx emissions was implemented 1992 and about 200 plants with energy output greater than 50 MWh were subject to the regulation. Currently, the NOx charge applies to plants in a range of industries producing above a specified energy output threshold. The percentage of firms with established NOx mitigation technologies has shown a significant rise and NOx emissions from regulated plants decreased by 50% between 1992 and 2007.

In **Japan**, several environment-related taxes have been introduced. Tax incentives for new low-emission vehicles or high fuel efficiency vehicles have encouraged consumers to replace old cars with new eco-friendly vehicles, such as hybrid cars and electric cars. Home insulation and industrial investments in energy efficient or renewable energy facilities have been incentivised by tax measures as well.

In **Canada**, the province of British Columbia charges a tax on various energy products, such as petrol, diesel, natural gas, heating oil, coke and aviation fuel for flights. The current tax rate is equivalent to CAD 15 (Canadian dollars) per tonne of CO₂ and will be raised to CAD 30 per tonne by 2012.

Source: OECD (2010d, 2010e, 2011e, 2011f).

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