Appliances Guide

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The overall worldwide saving potential from domestic refrigerators and freezers

With results detailed for 11 world regions

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1. The overall worldwide energy and cost saving potential from domestic refrigerators and freezers

About 1,4 billion domestic refrigerators and freezers are in use worldwide. With an average annual electricity consumption of 450 kWh each, altogether they account for almost 14 % of the total electricity consumption from the residential sector and cause worldwide annual greenhouse gas emissions of 450 million tons of CO_{2eq}.

If every time a refrigerator or freezer is replaced, the most energy-efficient model is chosen as a replacement, 240 TWh of electricity and 159 million tons of CO_{2eq} per year can be cost-effectively saved by 2020. Even further savings are achievable by 2030.

Households all round the world are currently using 1,4 billion refrigerators, fridge freezers and freezers. The average annual consumption of all these cold appliances amounts to about 453 kWh. In total, this causes an annual electricity consumption of 649 TWh, which is more than the total electricity consumption of Germany, for example.

As model calculations show, enormous efficiency improvements can be achieved if old inefficient models are replaced by modern energy-efficient ones. The worldwide annual electricity consumption by domestic cold appliances could be reduced from 649 TWh to 475 TWh by 2020 and to 413 TWh by 2030. This is despite the expected 27 % increase in the number of cold appliances in use by 2020 and the 62 % increase by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

The calculations also show that policy measures and programmes to capture this potential improvement are cost-effective for society as well as for end-users (see also table 1). Over the lifetime of the energy-efficient refrigerators and freezers in use by 2030, consumers worldwide would benefit from total net savings of around € 13 billion (including energy taxes and value added taxes) while net benefits to society would be about € 10 billion. However, this is dependent on different investment costs and different electricity tariffs or prices. The incremental investment

costs for the best available technology (BAT) could be very low in countries where already high efficiency standards are established and high where no market and no manufacturer of efficient refrigerators and freezers exists.
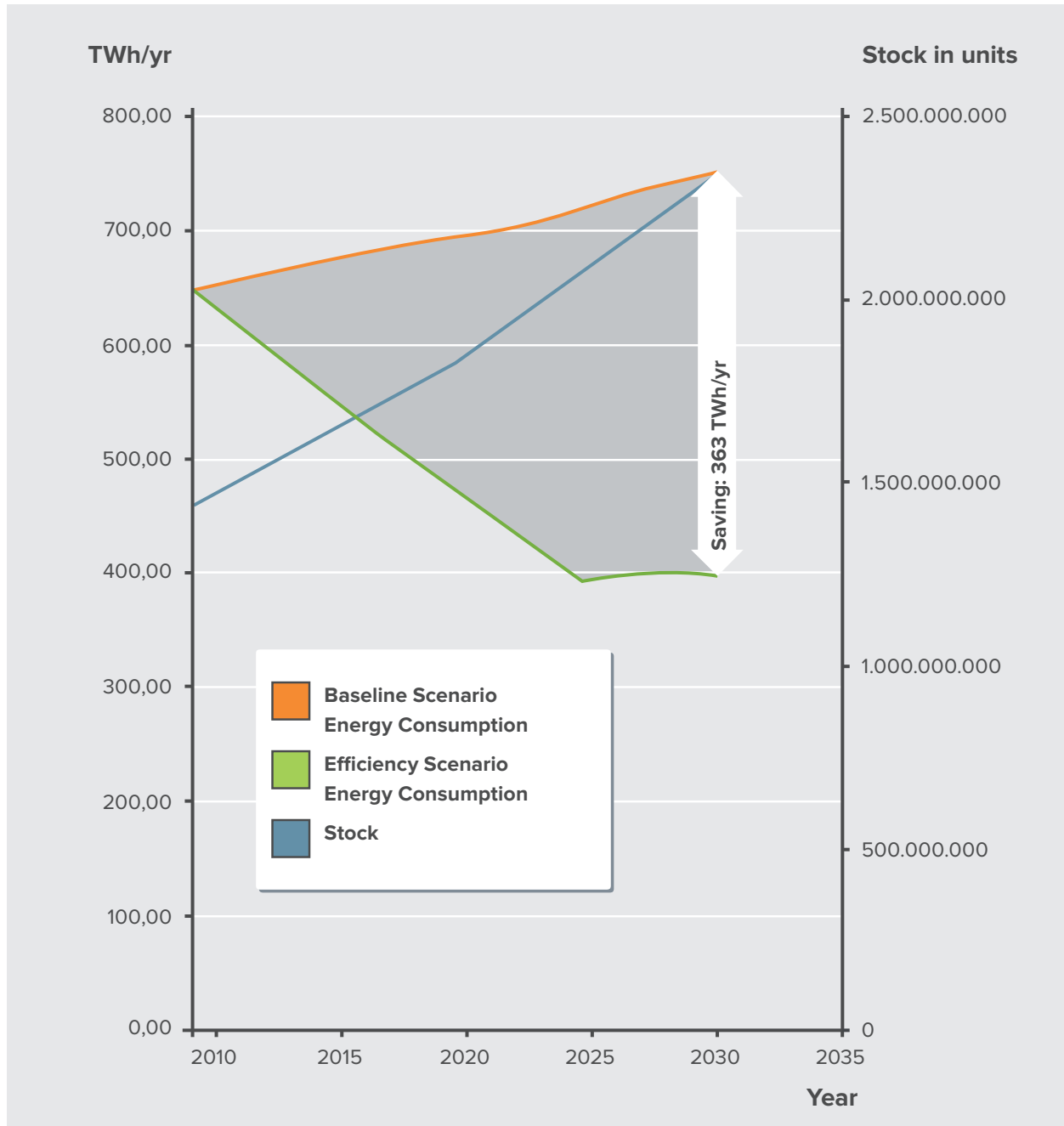

Fig. 1 Total electricity consumption of domestic cold appliances in the Baseline Scenario versus the Efficiency Scenario (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

Current data	Population	6,859,396,560
	Total electricity net consumption per year	17,434 TWh/year
	Total domestic electricity consumption per year	4,686 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	649 TWh/year
	Stock number of domestic refrigerators and freezers	1,435,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	453 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	450 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	240 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-174 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	159 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	1,822,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	192 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 9,062 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0312 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0885 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 3,921 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 9,320 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	361 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-236 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	221 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	2,332,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	160 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 8,277 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0427 /kWh
	Average net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1020 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 9,950 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 12,956 mn/year

mn = million

Table 1: Population and electricity consumption data of domestic cold appliances for the whole world for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

Worldwide distribution and electricity consumption of domestic refrigerators and freezers

The distribution of domestic refrigerators and freezers and the related electricity consumption is very uneven between different world regions.

In many regions, appliance ownership is expected to grow in the future.

The distribution of domestic refrigerators and freezers (cold appliances) is very uneven between different world regions. In North America, Western Europe and Pacific OECD 1.6 to 1.7 people own one cold appliance, whereas in other world regions the level of ownership is well below saturation (see fig. 2). This is expected to grow in the future.

In principle, the same technology and kind of appliances are used worldwide though there are some differences regarding types of appliances, refrigerants, efficiency standards and recycling procedures.
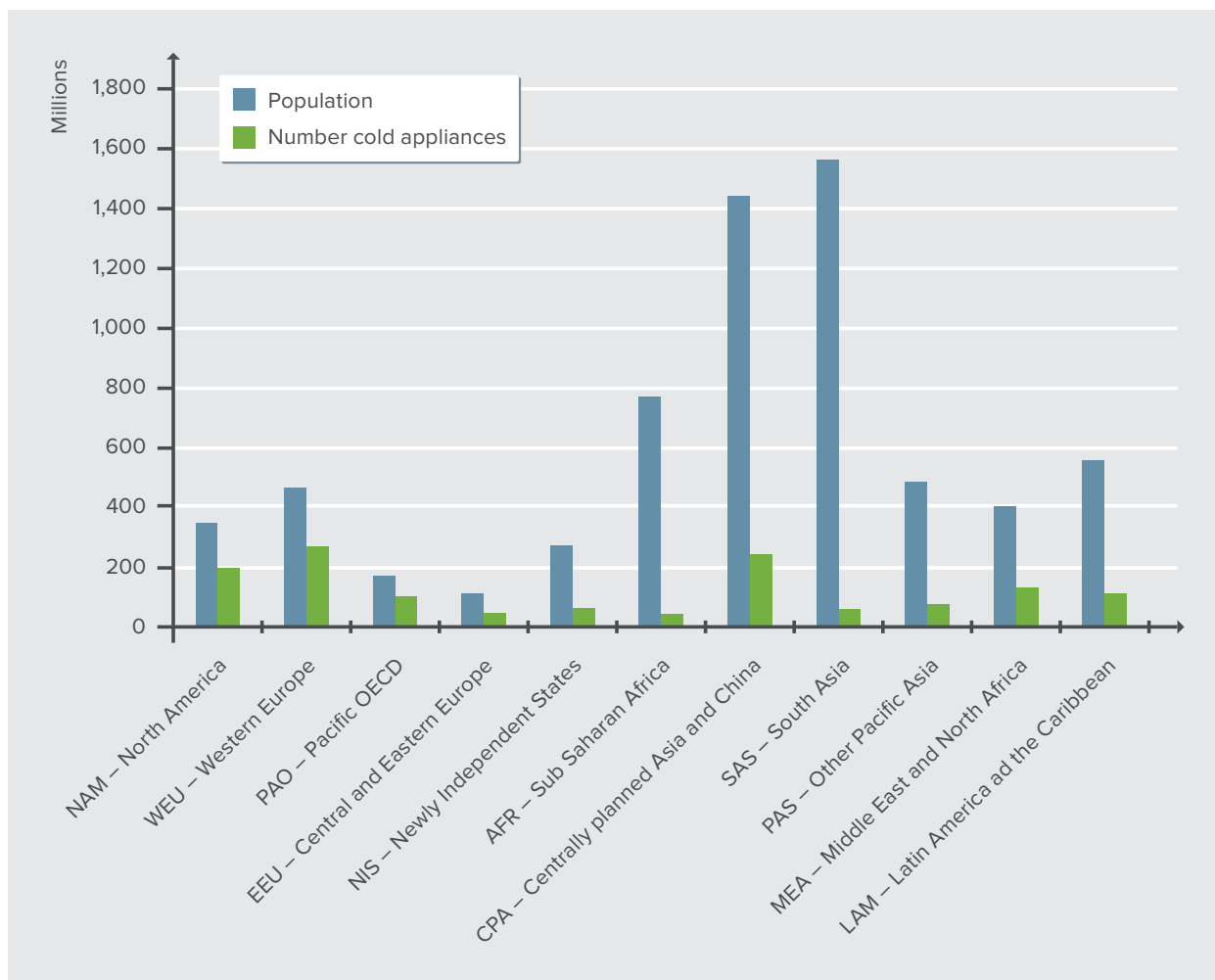
Figure 2: World population and number of cold appliances in the different world regions after IPCC systematic (Source: WEC 2009, IEA 2010 and own calculation)

The worldwide uneven distribution of domestic refrigerators and freezers and their different efficiency levels leads to large differences in electricity consumption of this application in different world regions (see fig. 3)
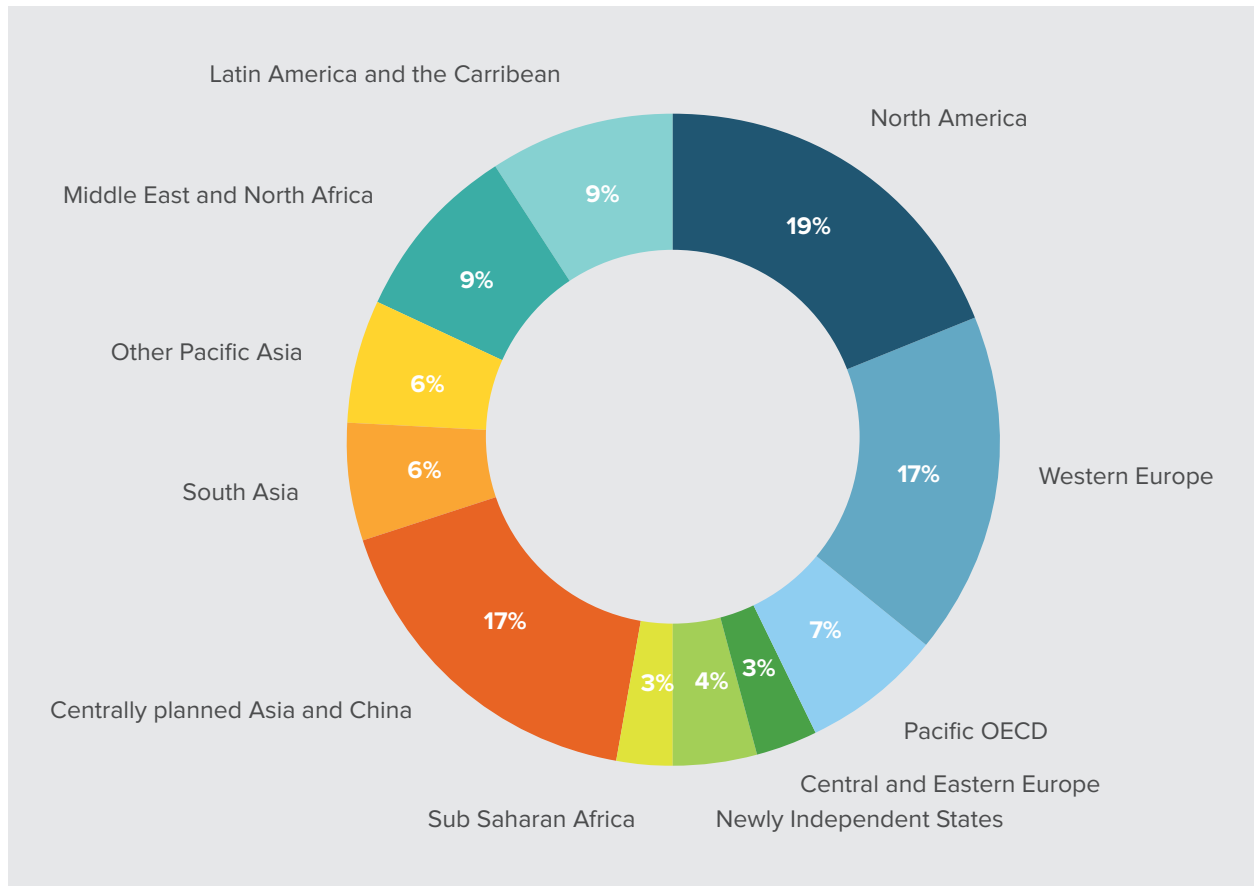
Figure 3: Worldwide distribution of electricity consumption for domestic cold appliances

2.0 The energy and cost saving potential from domestic refrigerators and freezers by world region

2.1 NAM – North America

2.1.1 Included countries

Aruba, Bermuda, Canada, Cayman Islands, Falkland Islands, Guam, Puerto Rico, Saint Pierre and Miquelon, United States, Virgin Islands- (U.S.), Virgin Islands - (British).

2.1.2 Key messages and data

About 209 million domestic refrigerators and freezers (cold appliances) are in use in North America. With an average annual electricity consumption of 590 kWh each, they account altogether for almost 8 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 108 million tons of CO_{2eq}.

If every time, a cold appliance is replaced, the most energy-efficient model is chosen, 44 TWh of electricity and 35 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

209 million refrigerators, fridge freezers and freezers are in use in North America. The average annual consumption of all these cold appliances amounts to about 590 kWh, which is very high and due to the big appliances and their poor efficiency. This causes in total, an annual electricity consumption of 123 TWh, which, as an example, is more than the total domestic electricity consumption of Sub-Saharan Africa.
As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. The North American annual electricity consump-

tion by domestic cold appliances could be reduced from 107 TWh to 66 TWh by 2020 and to 46 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

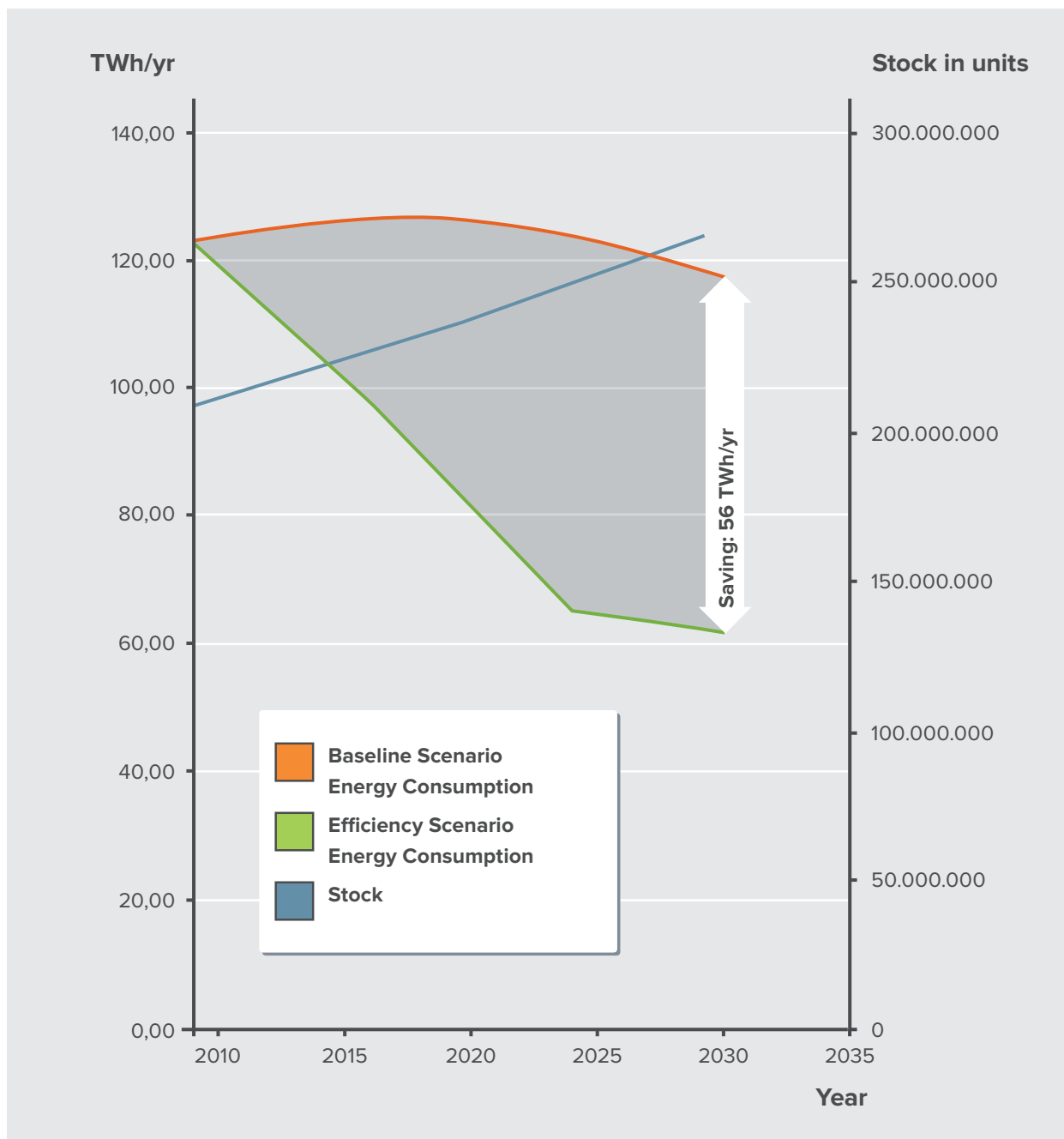Figure 4: Total electricity consumption of domestic cold appliances in North America in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 2).

Current data	Population	352,728,816
	Average number of refrigerators and freezers per household	> 100%
	Total electricity net consumption per year	4,454 TWh/year
	Total domestic electricity consumption per year	1,602 TWh/year
	Total electricity consumption by domestic refrigerators and freezers per year	123.31 TWh/year
	Stock number of domestic refrigerators and freezers	209,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	590 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	107.77 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	43.66 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-41.19 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	35.22 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	235,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	250 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 1,577 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0325 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0906 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 1,780 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 762 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	55.77 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-61.34 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	41.51 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	265,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	200 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 1,076 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.047 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1089 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 1,825 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 2,307 mn/year

mn = million

Table 2: Population and electricity consumption data for North America for 2008 and potential changes by 2020 and 2030 (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.2 WEU and EEU - Western, Central and Eastern Europe

2.2.1 Included countries:

Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Cyprus (incl. North Cyprus), Denmark, Faroe Islands, Finland, France, Germany, Gibraltar, Greece, Greenland, Hungary, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Macedonia, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia (incl. Kosovo), Slovakia, Slovenia Spain, Sweden, Switzerland, Turkey and United Kingdom.

2.2.2 Key messages and data

About 335 million domestic refrigerators and freezers (cold appliances) are in use in Western, Central and Eastern Europe. With an average annual electricity consumption of 377 kWh each: Altogether they account for almost 14 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 58 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 58 TWh of electricity and 16 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

335 million refrigerators, fridge freezers and freezers are in use in Western, Central and Eastern Europe. The average annual consumption of all these cold appliances amounts to about 377 kWh, which is already quite efficient in comparison to other world regions. This causes in total, an annual electricity consumption of 126 TWh, which is typically 50 % more than the total domestic electricity consumption of Sub-Saharan Africa.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. The European annual electricity consumption by domestic cold appliances could be reduced from 126 TWh to 82 TWh by 2020 and to 59 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.
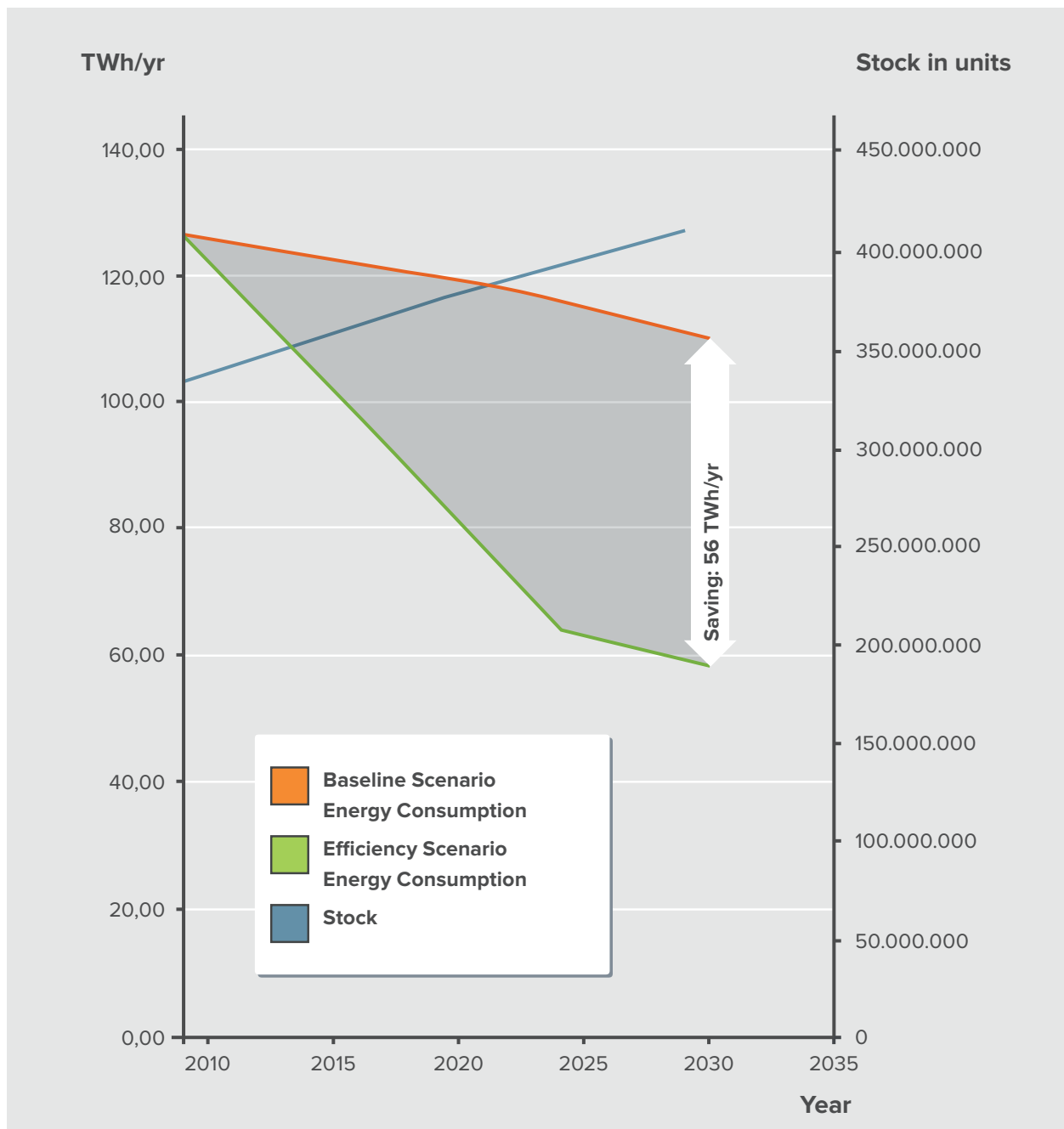
Figure 5: Total electricity consumption of domestic cold appliances in Western, Central and Eastern Europe in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 3).

Current data	Population	600,872,150
	Average number of refrigerators and freezers per household	> 100%
	Total electricity net consumption per year	3,396 TWh/year
	Total domestic electricity consumption per year	943 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	126 TWh/year
	Stock number of domestic refrigerators and freezers	335,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	377 kWh/year
	Total annual CO_{2eq} emissions related with domestic cold appliances	58.34 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	38.15 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-44.26 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	16.27 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	376,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	150 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 1,695 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0250 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0785 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 498 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 1,310 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	51.97 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-67.21 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	20.45 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	411,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	125 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 1,427 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0336 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.0873 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 1,180 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 1,671 mn/year

mn = million

Table 3: Population and electricity consumption data for Western, Central and Eastern Europe for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.3 PAO – Pacific OECD

2.3.1 Included countries

Australia, Cook Islands, Japan, New Zealand, Niue, South Korea.

2.3.2 Key messages and data

About 108 million domestic refrigerators and freezers (cold appliances) are in use in Pacific OECD countries. With an average annual electricity consumption of 450 kWh each, altogether they account for almost 12 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 25 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 14 TWh of electricity and 6,8 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

108 million refrigerators, fridge freezers and freezers are in use in Pacific OECD countries. The average annual consumption of all these cold appliances amounts to about 450 kWh, which is already quite efficient in comparison to North American models. This causes in total an annual electricity consumption of 48.6 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. The Pacific OECD countries' annual electricity consumption by domestic cold appliances could be lowered from 48.6 TWh to 35.7 TWh by 2020 and to 28 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

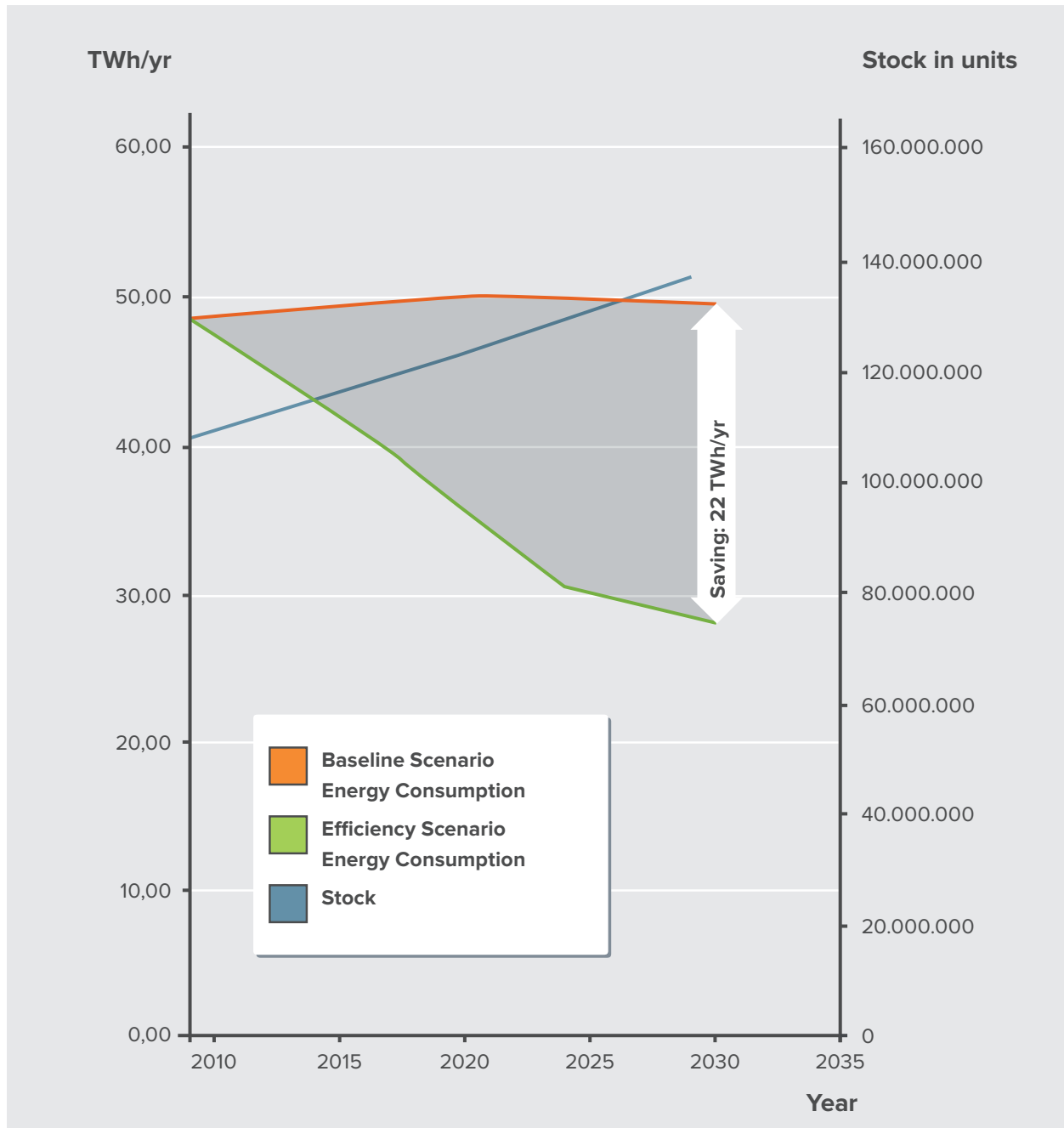Figure 6: Total electricity consumption of domestic cold appliances in Pacific OECD countries in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 4).

Current data	Population	201,061,224
	Average number of refrigerators and freezers per household	> 100%
	Total electricity net consumption per year	1,684 TWh/year
	Total domestic electricity consumption per year	428 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	48.6 TWh/year
	Stock number of domestic refrigerators and freezers	108,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	450 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	25.02 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	14.28 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-12.86 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	6.79 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	122,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	220 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 821 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0134 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0598 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 99 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 368 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	21.60 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-20.61 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	9.48 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	137,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	170 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 641 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0319 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.0846 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 442 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 638 mn/year

mn = million

Table 4: Population and electricity consumption data for Pacific OECD countries for 2008 and potential changes by 2020 and 2030 (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.4 NIS – Newly Independent States

2.4.1 Included countries

Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

2.4.2 Key messages and data

About 69 million domestic refrigerators and freezers (cold appliances) are in use in Newly Independent States. With an average annual electricity consumption of 413 kWh each, together they account for almost 15 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 13.6 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 13 TWh of electricity and 5.5 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

69 million refrigerators, fridge freezers and freezers are in use in the Newly Independent States. The average annual consumption of all these cold appliances amounts to about 413 kWh, which is not so much in comparison to other world regions. In these countries many small but inefficient models are in use. This causes an annual electricity consumption of 28,5 TWh in total.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. The Newly Independent States' annual electricity consumption by domestic cold appliances could be lowered from 28.5 TWh to 20.8 TWh by 2020 and to 17.8 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

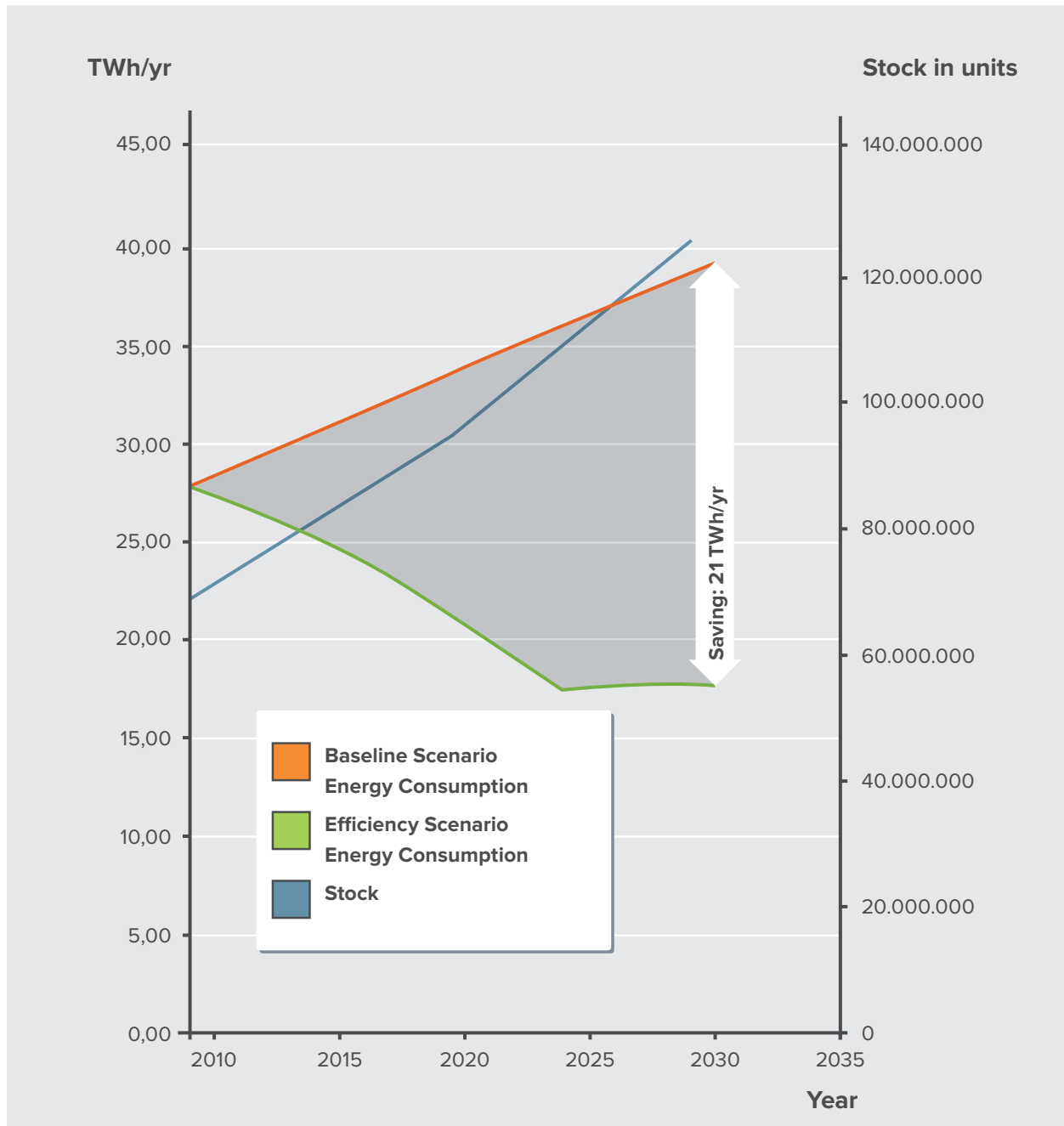Figure 7: Total electricity consumption of domestic cold appliances in the Newly Independent States in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 5).

Current data	Population	283,540,000
	Average number of refrigerators and freezers per household	≈ 100%
	Total electricity net consumption per year	1,238 TWh/year
	Total domestic electricity consumption per year	187 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	28.5 TWh/year
	Stock number of domestic refrigerators and freezers	69,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	413 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	13.63 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	12.97 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-7.74 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	5.53 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	93,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	150 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 434 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0351 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0949 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 233 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 528 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	21.35 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-10.68 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	8.7 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	125,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	125 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 460 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0456 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1068 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 604 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 770 mn/year

mn = million

Table 5: Population and electricity consumption data for the Newly Independent States for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.5 AFR – Sub-Saharan Africa

2.5.1 Included countries

Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Brazzaville), Congo (Kinshasa), Cote d´Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauretania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia (incl. Somaliland), South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

2.5.2 Key messages and data

About 49 million domestic refrigerators and freezers (cold appliances) are in use in Sub-Saharan Africa. With an average annual electricity consumption of 416 kWh each, together they account for almost 24 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 16 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 16.4 TWh of electricity and 6.7 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

49 million refrigerators, fridge freezers and freezers are in use in Sub-Saharan Africa. The average annual consumption of all these cold appliances amounts to about 416 kWh, which is, considering the high temperatures and bad efficiencies of the models, quite low. But it is common to switch off refrigerators from time to time. Overall, cold appliances consume an annual electricity of 20.4 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. Sub-Saharan Africa's annual electricity consumption by domestic cold appliances could be lowered from 20.4 TWh to 17.6 TWh by 2020 and to 18.14 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

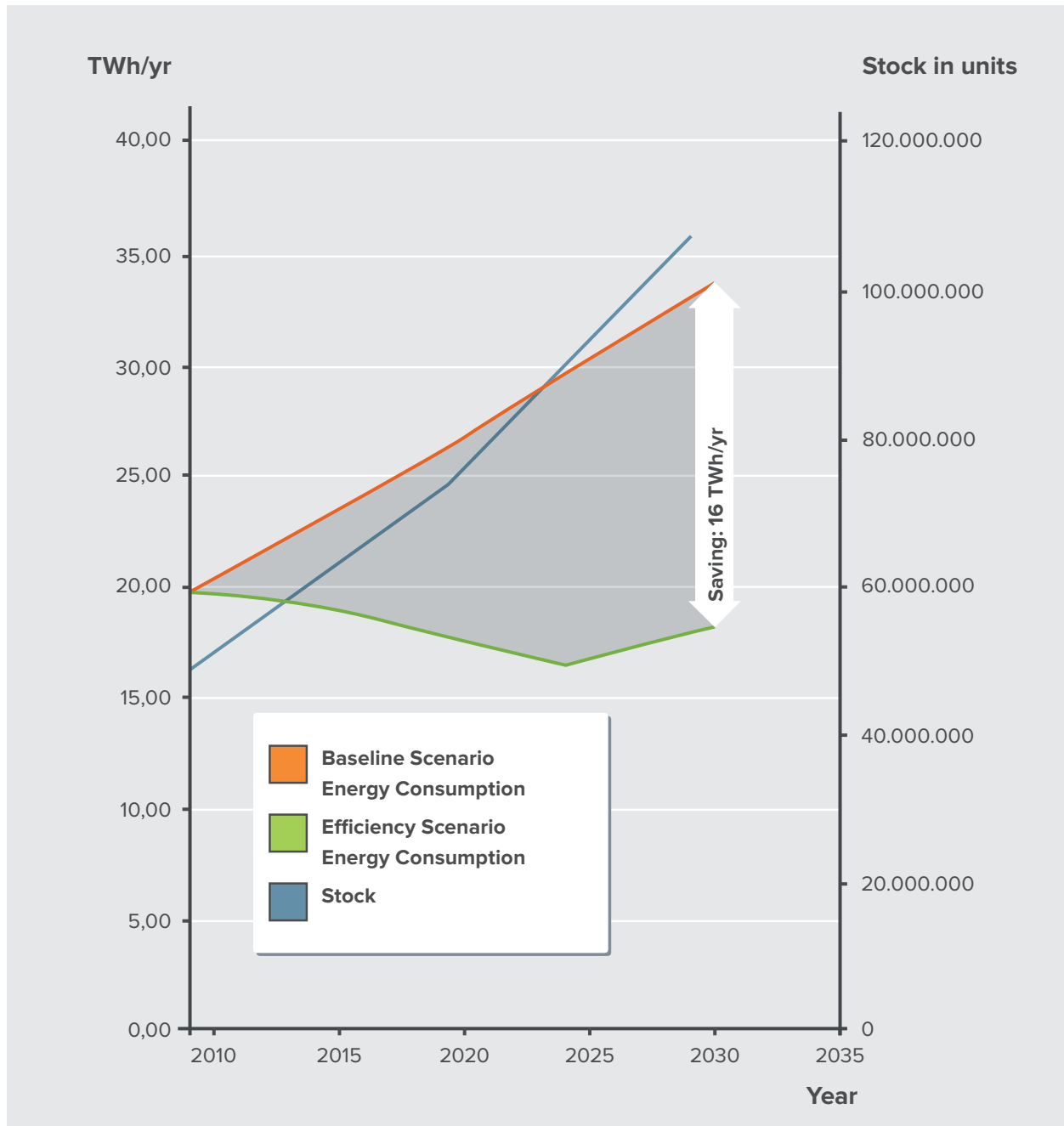Figure 8: Total electricity consumption of domestic cold appliances in Sub-Saharan Africa in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 6).

Current data	Population	800,157,500
	Average number of refrigerators and freezers per household	< 50%
	Total electricity net consumption per year	330 TWh/year
	Total domestic electricity consumption per year	85 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	20.4 TWh/year
	Stock number of domestic refrigerators and freezers	49,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	416 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	16.38 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	9.05 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-2.84 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	6.70 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	73,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	180 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 348 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0307 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0877 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 142 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 341 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	15.61 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-2.26 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	10.67 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	107,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	150 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 402 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0401 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.0978 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 380 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 505 mn/year

mn = million

Table 6: Population and electricity consumption data for Sub-Saharan Africa for 2008 and potential changes by 2020 and 2030 (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.6 CPA – Centrally planned Asia and China

2.6.1 Included countries

Cambodia, China, Hong Kong, Korea (North), Laos, Macau, Mongolia, Vietnam.

2.6.2 Key messages and data

About 260 million domestic refrigerators and freezers (cold appliances) are in use in Centrally planned Asia and China. With an average annual electricity consumption of 417 kWh each, together they account for almost 25 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 94 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 48 TWh of electricity and 38 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

260 million refrigerators, fridge freezers and freezers are in use in Centrally planned Asia and China. The average annual consumption of all these cold appliances amounts to about 417 kWh, which is already quite efficient in comparison to models used in other world regions. Overall cold appliances consume an annual electricity of 108 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. Centrally planned Asia and China's annual electricity consumption by domestic cold appliances could be lowered from 108 TWh to 93 TWh by 2020 and to 96.5 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.
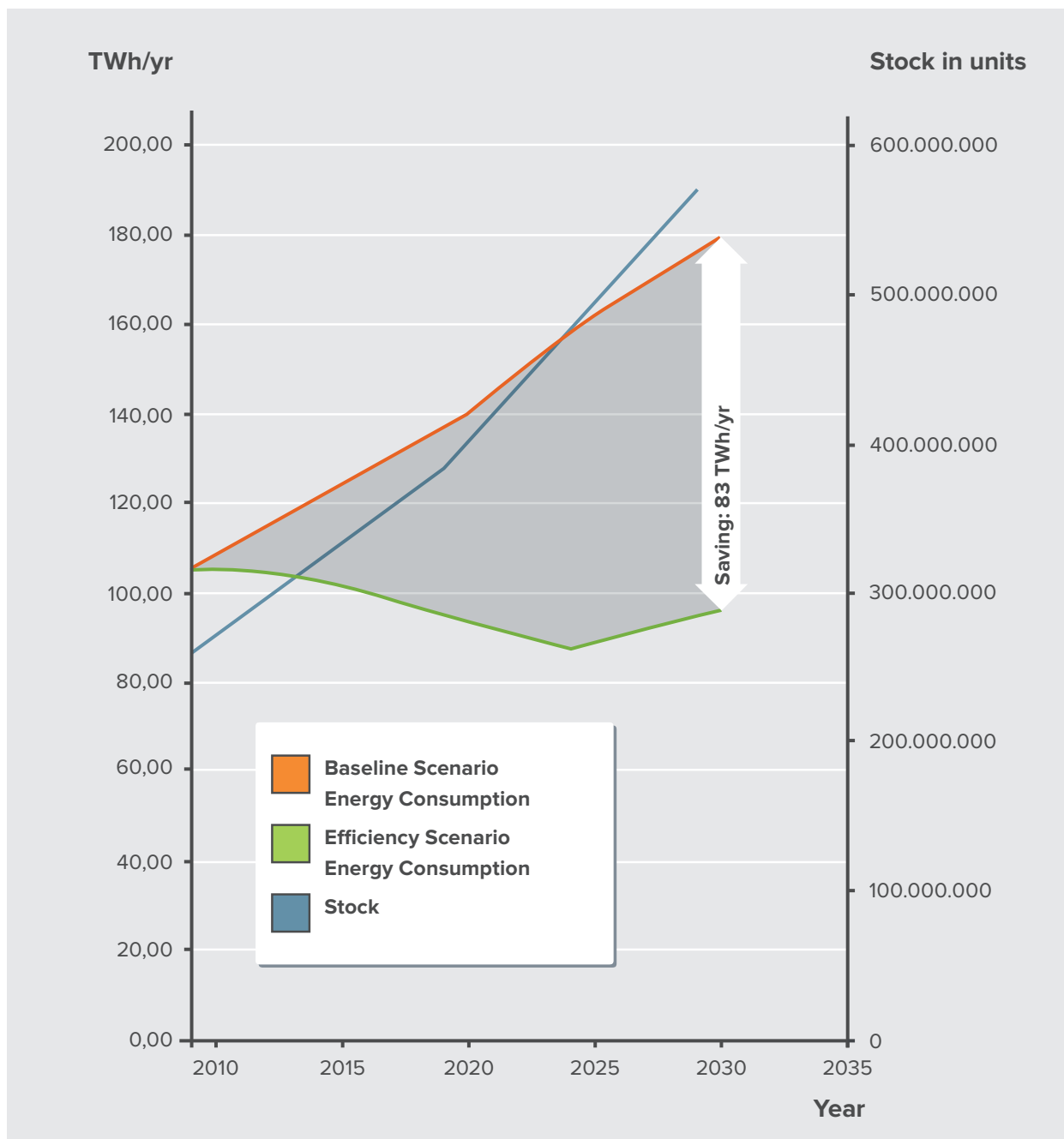
Figure 9: Total electricity consumption of domestic cold appliances in Centrally planned Asia and China in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 7).

Current data	Population	1,496,590,500
	Average number of refrigerators and freezers per household	< 100%
	Total electricity net consumption per year	3,103 TWh/year
	Total domestic electricity consumption per year	435 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	108 TWh/year
	Stock number of domestic refrigerators and freezers	260,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	417 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	93.9 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	47.63 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-15.62 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	38.1 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	385,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	180 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 1,697 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0333 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0918 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 813 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 1,881 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	83.14 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-11.79 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	61.37 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	570,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	150 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 1,630 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0494 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1129 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 2,486 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 3,095 mn/year

mn = million

Table 7: Population and electricity consumption data for Centrally planned Asia and China for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.7 SAS – South Asia

2.7.1 Included countries

Afghanistan, Bangladesh, Bhutan, Fiji, French Polynesia, India, Maldives, Nepal, Pakistan, Sri Lanka.

2.7.2 Key messages and data

About 63 million domestic refrigerators and freezers (cold appliances) are in use in South Asia. With an average annual electricity consumption of 638 kWh each, together they account for almost 23 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 47 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 19 TWh of electricity and 20 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

63 million refrigerators, fridge freezers and freezers are in use in South Asia. The average annual consumption of all these cold appliances amounts to about 638 kWh, which is very high and is caused by the high temperature and the bad efficiency of the appliances. Overall cold appliances consume an annual electricity use of 40 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. South Asia's annual electricity consumption by domestic cold appliances could be lowered from 40 TWh in 2020 to 29 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.

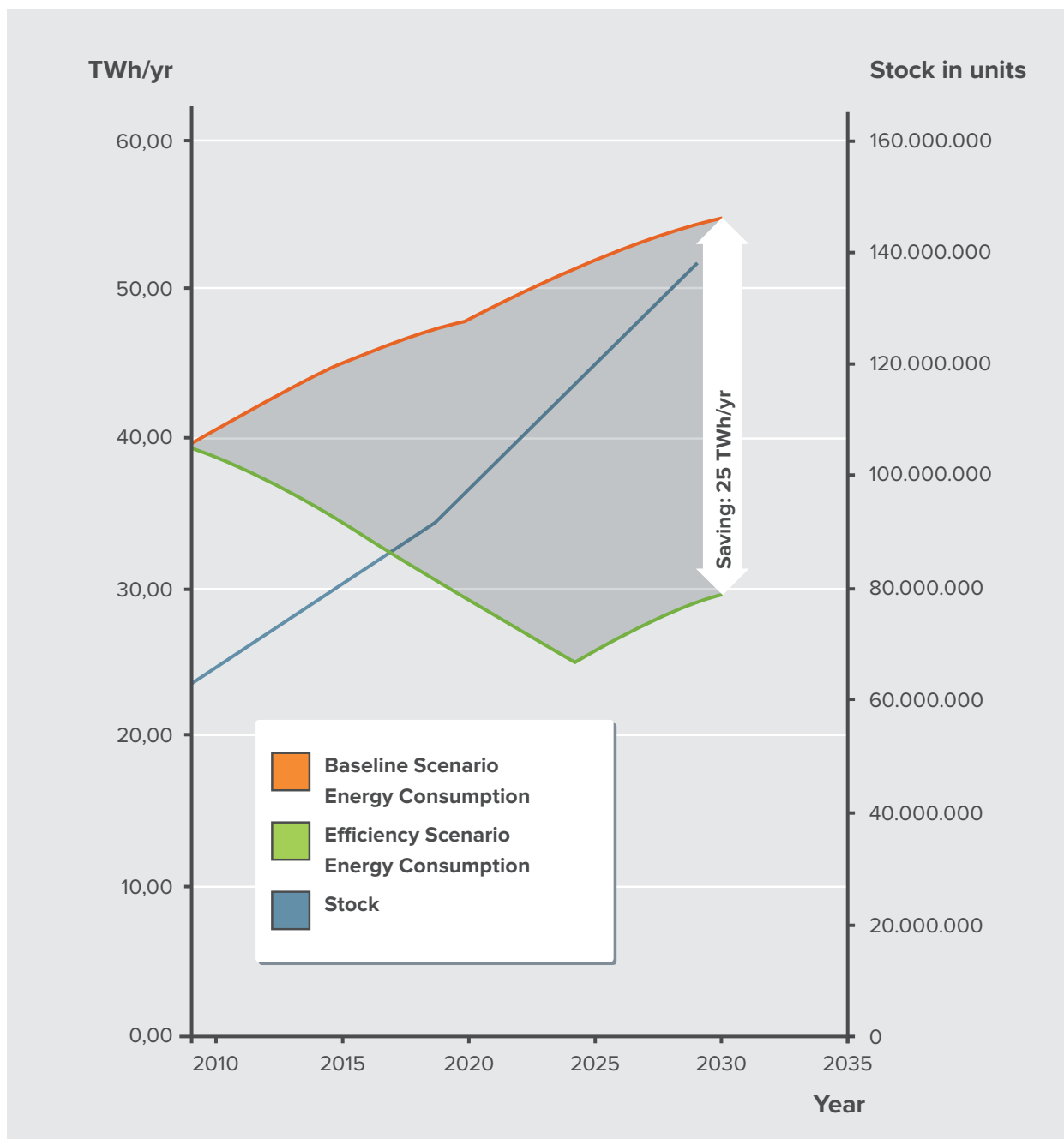Figure 10: Total electricity consumption of domestic cold appliances in South Asia in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 8).

Current data	Population	1,620,871,000
	Average number of refrigerators and freezers per household	< 25 %
	Total electricity net consumption per year	693 TWh/year
	Total domestic electricity consumption per year	174.2 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	40.19 TWh/year
	Stock number of domestic refrigerators and freezers	63,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	638 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	46.91 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	18.88 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-11.28TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	20.33 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	93,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	220 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 442 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0438 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.1088 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 449 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 936 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	25.13 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-10.79 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	24.97 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	138,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	200 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 522 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0451 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1060 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 782 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 1,001 mn/year

mn = million

Table 8: Population and electricity consumption data for South Asia for 2008 and potential changes by 2020 and 2030 (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.8 PAS – Other Pacific Asia

2.8.1 Included countries

American Samoa, Brunei, Burma (Myanmar), Indonesia, Kiribati, Malaysia, Micronesia, Nauru, New Caledonia, Papua New Guinea, Philippines, Salomon Islands, Samoa, Singapore, Taiwan, Thailand, Timor-Leste, Tonga, Vanuatu.

2.8.2 Key messages and data

About 82 million domestic refrigerators and freezers (cold appliances) are in use in Other Pacific Asia (excluding South Korea). With an average annual electricity consumption of 388 kWh each, together they account for almost 17 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 3 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 10.7 TWh of electricity and 7.2 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

82 million refrigerators, fridge freezers and freezers are in use in Other Pacific Asia (excluding South Korea). The average annual consumption of all these cold appliances amounts to about 388 kWh, which is less in comparison to models used in other world regions. This could result from smaller fridges. Overall cold appliances consume an annual electricity of 31.8 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. Other Pacific Asia (without South Korea) countries' annual electricity consumption by domestic cold appliances could be lowered from 31.8 TWh to 28.4 TWh by 2020 but this could rise again to 29.2 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.
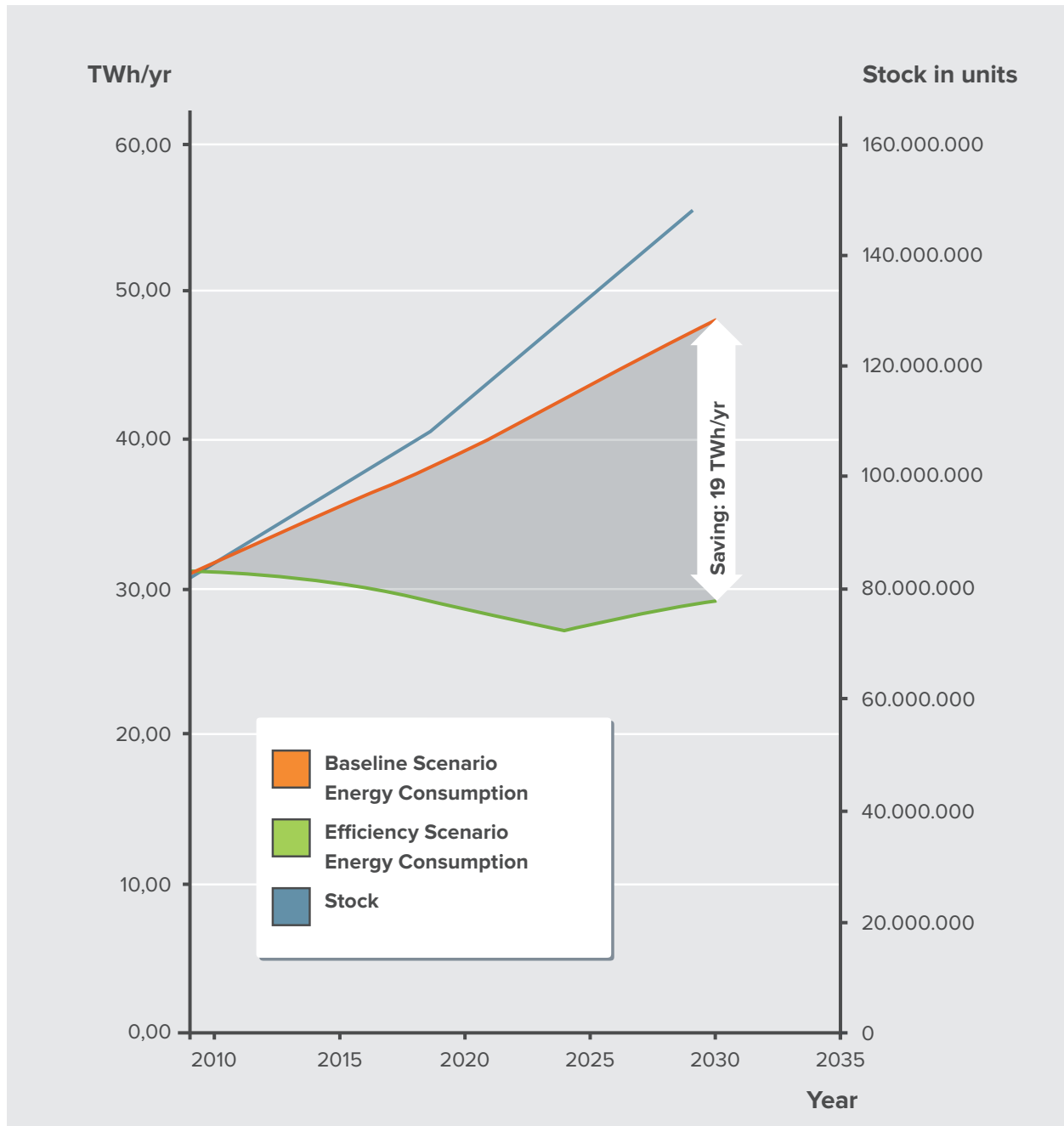
Figure 11: Total electricity consumption of domestic cold appliances in Other Pacific Asia in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 9).

Current data	Population	509,917,270
	Average number of refrigerators and freezers per household	≈ 100%
	Total electricity net consumption per year	687 TWh/year
	Total domestic electricity consumption per year	181 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	32 TWh/year
	Stock number of domestic refrigerators and freezers	82,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	388 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	23.07 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	10.73 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-3.38 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	7.19 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	110,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	210 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 513 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0221 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0739 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 122 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 340 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	18.92 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-2.57 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	11.70 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	148,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	175 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 546 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0358 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.0901 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 404 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 559 mn/year

mn = million

Table 9: Population and electricity consumption data for Other Pacific Asia for 2008 and potential changes by 2020 and 2030 (Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.9 MEA – Middle East and North Africa

2.9.1 Included countries

Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Western Sahara, Yemen.

2.9.2 Key messages and data

About 142 million domestic refrigerators and freezers (cold appliances) are in use in Middle East and North Africa. With an average annual electricity consumption of 425 kWh each, together they account for almost 16 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 44 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 23 TWh of electricity and 16 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

142 million refrigerators, fridge freezers and freezers are in use in Middle East and North Africa. The average annual consumption of all these cold appliances amounts to about 425 kWh, which is not so much in comparison to other world regions. In these countries, many small but inefficient models are in use. Overall cold appliances consume an annual electricity of 60 TWh.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. Middle East and North African countries' annual electricity consumption by domestic cold appliances could be lowered from 60 TWh to 47 TWh by 2020 and to 43.5 TWh by 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.
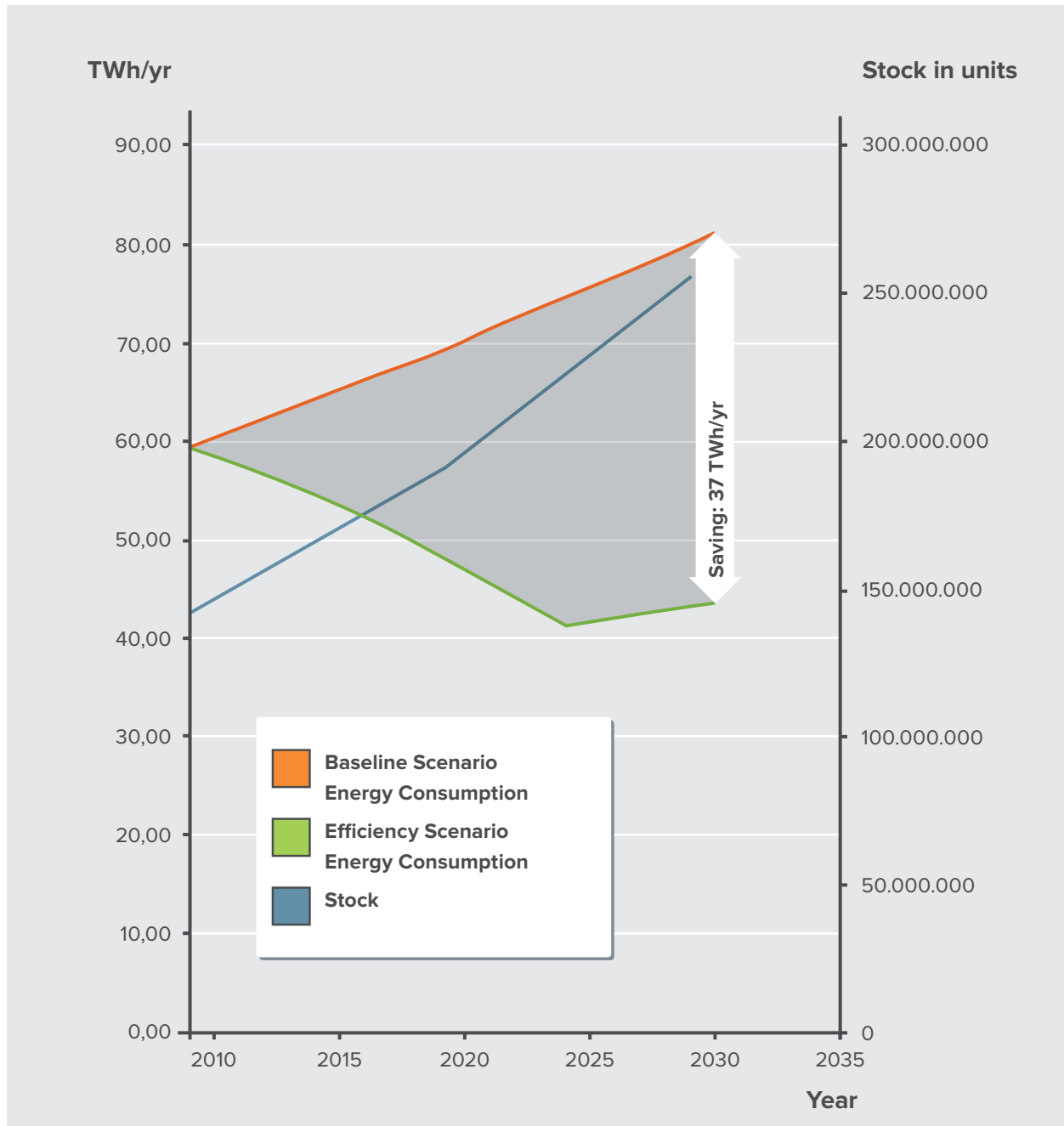
Figure 12: Total electricity consumption of domestic cold appliances in the Middle East and North Africa in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 10).

Current data	Population	420,130,000
	Average number of refrigerators and freezers per household	> 100%
	Total electricity net consumption per year	812 TWh/year
	Total domestic electricity consumption per year	370 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	60.39 TWh/year
	Stock number of domestic refrigerators and freezers	142,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	425 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	44.25 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	23.27 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-13.80 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	15.73 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	191,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	180 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 891 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0307 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0877 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 369 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 883 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	37.41 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-16.89 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	23,34 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	256,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	150 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 942 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0401 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.0978 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 938 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 1,247 mn/year

mn = million

Table 10: Population and electricity consumption data for the Middle East and North Africa for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

2.10 LAM – Latin America and the Caribbean

2.10.1 Included countries

Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, French Guyana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, St. Lucia, St. Vincent / Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

2.10.2 Key messages and data

About 118 million domestic refrigerators and freezers (cold appliances) are in use in Latin America and the Caribbean countries. With an average annual electricity consumption of 522 kWh each, together they account for almost 22 % of the total domestic electricity consumption and cause annual greenhouse gas emissions of 20.7 million tons of CO_{2eq}.

If every time a cold appliance is replaced, the most energy-efficient model is chosen, 21.6 TWh of electricity and 6.7 million tons of CO_{2eq} per year can be saved in a cost-effective way by 2020. Further cost-effective savings are achievable by 2030.

118 million refrigerators, fridge freezers and freezers are in use in Latin America and the Caribbean countries. The average annual consumption of all these cold appliances amounts to about 522 kWh, which is quite high but is partly due to the ambient temperature. This causes an annual electricity consumption of 61.6 TWh in total.

As model calculations show, enormous efficiency improvements can be achieved, if old inefficient models are replaced by modern efficient ones. Latin America and the Caribbean countries annual electricity consumption by domestic cold appliances could be lowered from 61.6 TWh to 40.6 TWh by 2020 and to 30.2 TWh in 2030.

These calculations are based on the most energy-efficient model being chosen as a replacement every time a new cold appliance is bought. They include anticipated improvements in the most efficient models over the years as well as increasing saturation and the trend to bigger models.
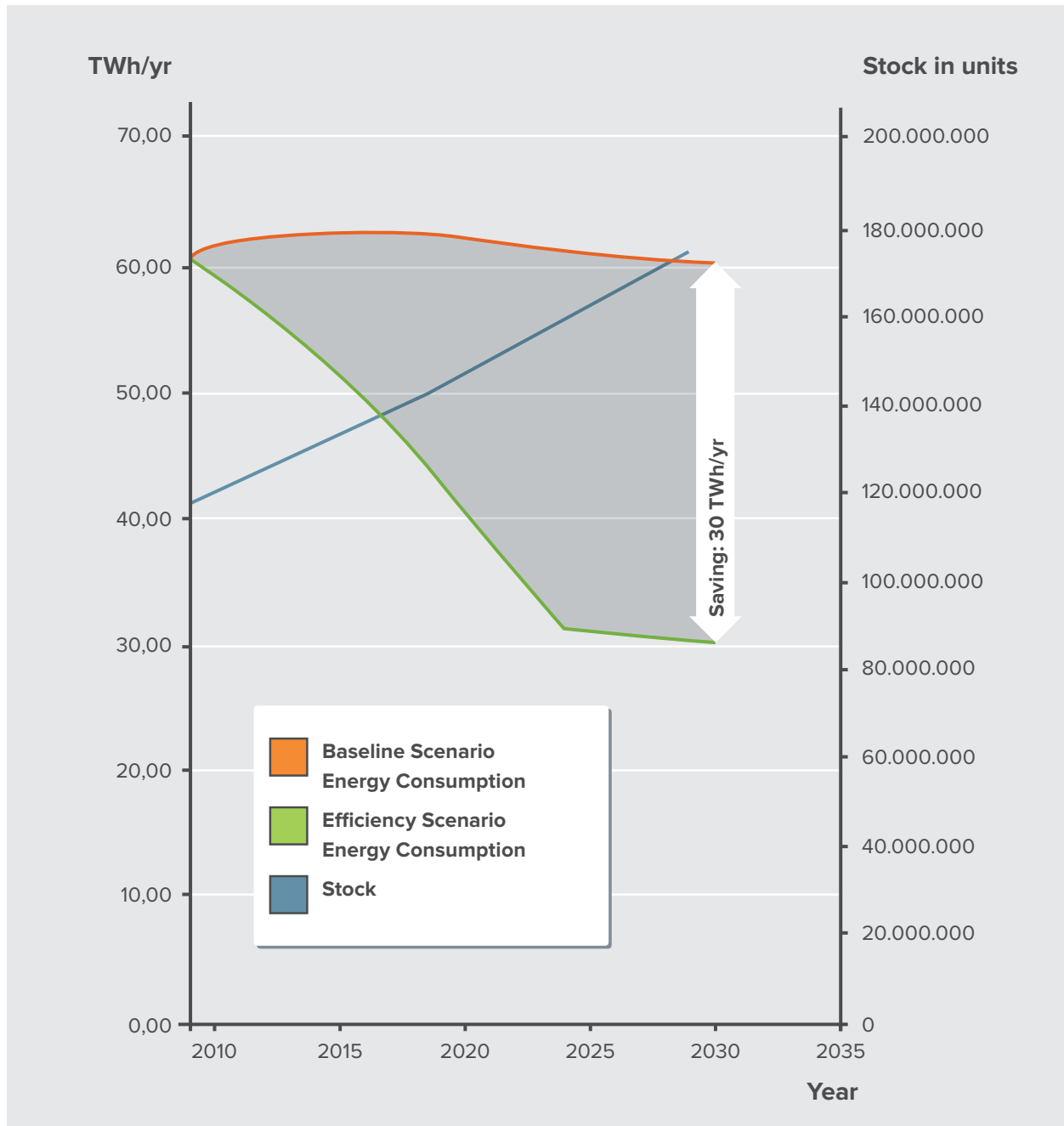
Figure 13: Total electricity consumption of domestic cold appliances in Latin America and the Caribbean in the Baseline Scenario versus the Efficiency Scenario
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

The calculations also show that policy measures and programmes, which address these potentials, are cost-effective for society as well as for end-users (see also table 11).

Current data	Population	578,528,100
	Average number of refrigerators and freezers per household	≈ 100%
	Total electricity net consumption per year	1,035 TWh/year
	Total domestic electricity consumption per year	282 TWh/year
	Total electricity consumption of domestic refrigerators and freezers per year	61.62 TWh/year
	Stock number of domestic refrigerators and freezers	118,000,000
	Average annual electricity consumption of refrigerators and freezers in the stock	522 kWh/year
	Total annual CO_{2eq} emissions related to domestic cold appliances	20.67 mn t/year
Possible savings effects by 2020	Electricity savings potential in 2020 vs. baseline growth	21.59 TWh/year
	Resulting change in electricity consumption 2020 vs. 2010	-20.96 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	6.68 mn t/year
	Stock number of domestic refrigerators and freezers in 2020	144,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2020	180 kWh/year
	Total incremental investment costs each year until 2020 (societal perspective)	€ 644 mn/year
	Average net economic gain per saved kWh (societal perspective) until 2020	€ 0.0378 /kWh
	Average net economic gain per saved kWh (end-user perspective) until 2020	€ 0.0992 /kWh
	Average total net benefit (societal perspective) each year until 2020	€ 434 mn/year
	Average total net benefit (end-user perspective) each year until 2020	€ 955 mn/year
Possible savings effects by 2030	Electricity savings potential in 2030 vs. baseline growth	30.07 TWh/year
	Resulting change in electricity consumption 2030 vs. 2010	-31.46 TWh/year
	CO_{2eq} emission reduction potential vs. baseline growth	8.59 mn t/year
	Stock number of domestic refrigerators and freezers in 2030	175,000,000
	Average annual electricity consumption of new refrigerators and freezers (all BAT) in 2030	150 kWh/year
	Total incremental investment costs each year between 2020 and 2030 (societal perspective)	€ 630 mn/year
	Average net economic gain per saved kWh (societal perspective) between 2020 and 2030	€ 0.0451 /kWh
	Net economic gain per saved kWh (end-user perspective) between 2020 and 2030	€ 0.1059 /kWh
	Average total net benefit (societal perspective) each year between 2020 and 2030	€ 908 mn/year
	Average total net benefit (end-user perspective) each year between 2020 and 2030	€ 1,162 mn/year

mn = million

Table 11: Population and electricity consumption data for Latin America and the Caribbean countries for 2008 and potential changes by 2020 and 2030
(Source: own calculation; WEC 2009 and IEA 2010 for current electricity consumption and population data)

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Your guide to energy efficiency in buildings.

bigee.net

bigEE is an international initiative of research institutes for technical and policy advice and public agencies in the field of energy and climate, co-ordinated by the Wuppertal Institute (Germany). Its aim is to develop the international web-based knowledge platform bigee.net for energy efficiency in buildings, building-related technologies, and appliances in the world's main climatic zones.

The bigee.net platform informs users about energy efficiency options and savings potentials, net benefits and how policy can support achieving those savings. Targeted information is paired with recommendations and examples of good practice.

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and Energy

Partners to date

Financial support

Federal Ministry for the
Environment, Nature Conservat
and Nuclear Safety

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