

AGROCOM
BIOGAS

CLAAS

System competence Biogas management



Biogas plant management a generation further on.



In cooperation with



eco-innovation 
MORE RESPONSIBLE. BETTER FOR ENVIRONMENT.



CLAAS

CLAAS Agrosystems GmbH & Co KG

CLAAS Agrosystems

We are one of the leading suppliers of crop cultivation systems and rank among the pioneers in the field of software for biogas plants. This know-how can help both operators and manufacturers. By exploiting all the functions available in AGRO BioGas, profitable biogas production is virtually guaranteed. The software is being developed between 2009/2011 within the scope of the EU project BIOCYCLA and with the support of Eco-innovation.

PARTNER L.e.e.

Our partner, L.e.e., is an independent engineering office supplying innovative technical know-how for customised bio-energy projects all over the world - independent of any specific production or procedural concepts! Reliable, holistic, and 100% ecological and economic in all aspects of planning, development, construction and support.





- Answers to all your questions: What is going into the system? Who delivered what and where did it come from? How much energy and biogas slurry resulted from the mix? What is being sent where and whereabouts is it being spread? What's the nutritional composition like? AGRO BioGas supplies the answers!
- The entire process at a glance: AGRO BioGas takes many factors into account which are outside the direct sphere of the production unit itself - from the production of the energy sources via biogas biology and the energy production phase through to the recycling of the residues.
- Accurate and orderly bookkeeping: You can enter the data from the yield mapping reports or use the interface to the input weighing station - AGRO Biogas makes sure you keep your suppliers' accounts tidy.
- Optimise the methane yield: Simulate various crop and cost optimisation scenarios at the input level with the AGRO Biogas analysis and planning tool.
- Keep on the safe side when it comes to legalities: You can always produce evidence in connection with set aside areas, for example, and the nutrient balance sheet can be prepared more or less on the side.
- Reduce CO₂ emissions and save fuel: With the help of digital graphic data you can optimise transport routes and reduce CO₂ emissions.

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Data compilation and raw materials management.

- AGRO Biogas assists plant operators by improving the efficiency of resources and capacity management. This is of particular value since most modern biogas units are run on a cooperative basis, frequently involving a large number of suppliers.
- AGRO BioGas has a logical structure and is very user-friendly. All tasks connected with the production of energy crops, as well as other sources of energy (slurry, waste etc.), can be recorded. As a first step the input quantities are calculated in advance. When biomass is purchased, the programme calculates how much energy the operator can produce (electricity, heat), how long the biomass will last and how much should be paid.
- The management programme supports interfaces to various weighing stations. You have proof of the quantities and qualities supplied and can settle up with suppliers directly on the basis of this data.
- The transparent stock management system displays the location and quantities of energy sources available and also what transport routes have to be taken into consideration. You also have an overview of all available areas as well as a permanent calculation of expenditure and income, including transport costs.

A holistic approach: integrated raw materials management.

AGRO BioGas' integrated raw materials management system incorporates important monitoring and planning functions which guarantee uninterrupted and efficient plant operation. The operator can see how much is in the silos in all the stores at any time. He can also define minimum and maximum fill levels. The programme automatically sends a warning if a raw material in the silo starts running low or if the slurry is reaching maximum capacity. This gives the operator enough time to plan and act before the threshold level is actually reached.





Biogas biology makes all the difference.

Who delivered what? How much? How much was spread and where? By monitoring the biology, the operator can be sure that the calculations correspond to the real situation. Temperatures, PH values, acids, input, stirring times and engine running times are all monitored. In addition, all data are saved and entered in an annual report.

It is very important that data are documented in order to guarantee the required transparency. AGRO BioGas makes sure that contracts and the delivery of biomass are professionally managed.

The perfect base: Yield data from the forage harvester

Field by field documentation has to comply with very strict official requirements these days if farmland is to be used for biogas production. This was good enough reason for us to apply our competence and expertise in yield mapping for combines to this application for forage harvesters. The solution delivers accurate site specific measurements of chopped quantities from the CLAAS JAGUAR series. As a result invoicing can be done using the exact amounts harvested as an alternative to the traditional method of weighing the load on a weighbridge.



THE NUTRIENT BALANCE SHEET

Planning and process management.

- The management programme documents all the processes during production. It allows a precise calculation of the sources of energy used, the energy produced and the biogas slurry spread for each farm and each field. AGRO BioGas presents these material flows graphically so that the entire input, utilisation and logistics can be planned clearly in advance. It's also a help when it comes to fertilising: The soil analysis determines what fertilising measures are needed.
- If organic fertilisers are spread on the fields, previous crops, drinking water protection areas and many other factors are taken into consideration. Other organic fertilisers, apart from biogas slurry, are also taken into account. The programme then calculates what quantities of mineral fertilisers may be spread on the fields. At the end of this process farmers have a very valuable and informative list of all fertilisers applied during the entire harvest year.
- The aim is the best possible distribution of the end product. In order to achieve this, the biomasses supplied for the biogas plant have to be analysed. The ratios of nitrogen, phosphorous, potassium and magnesium are measured. Input substances are compared with the final substrate and at the end the farmer gets exactly the same quantity of nitrogen

back as he put into the biogas plant. Different allowances have to be made for either members of the cooperative or companies that act merely as suppliers, as well as for any particular features of the fields, such as drinking water protection areas, extensification areas and pastureland.

Optimisation of the methane yield.

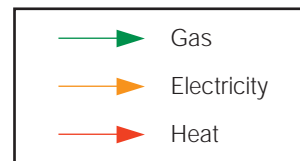
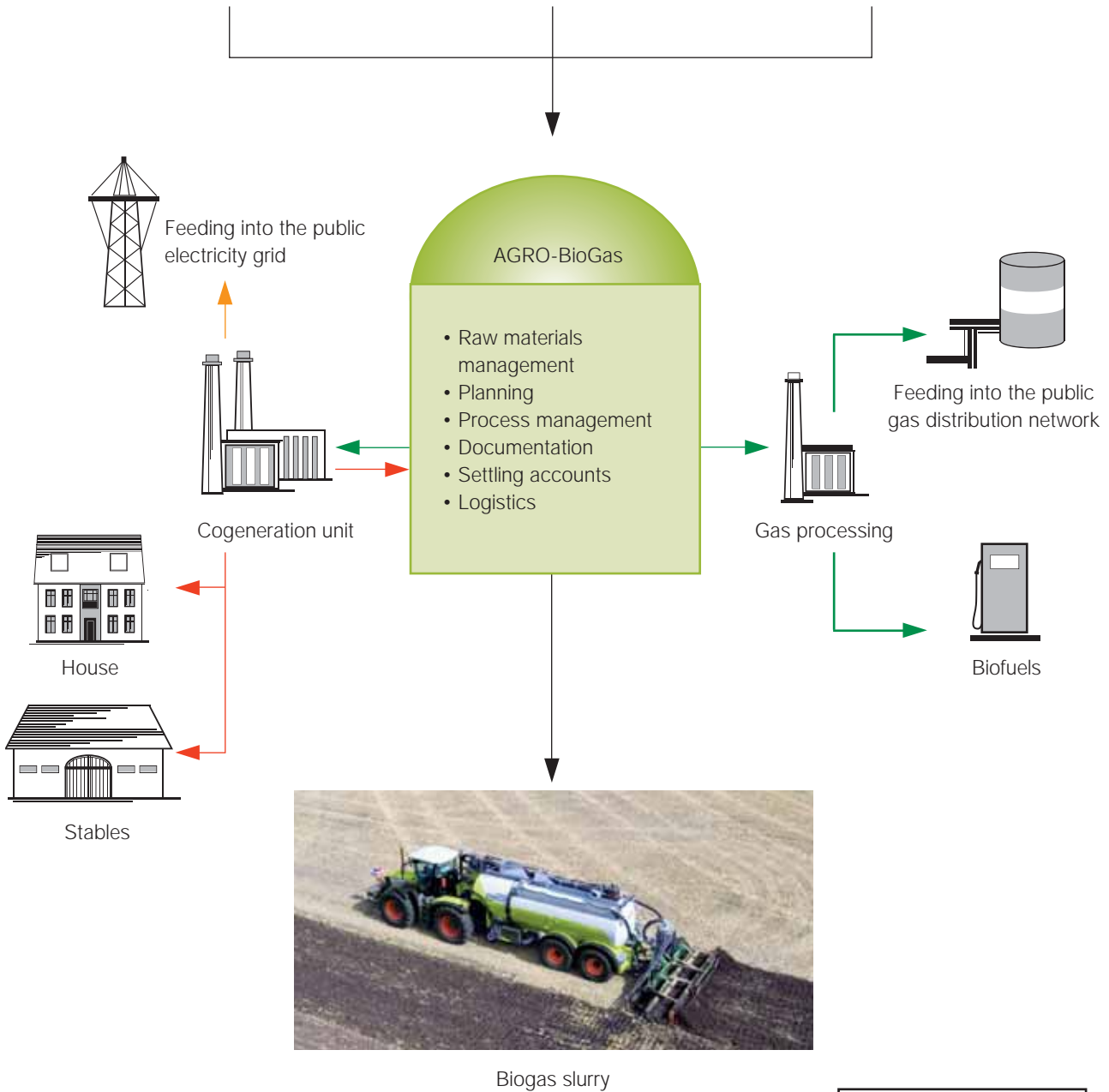
Biogas is produced from various energy sources which generate differing amounts of energy. The programme displays where the different energy sources can be obtained; the end result is a better return on your biogas production. Who should deliver what, for example, and how much, in order to guarantee the most cost-effective methane yield possible. The analysis and planning tool integrated into AGRO BioGas provides you with a breakdown of costs according to cultures, e.g. grass, corn or cereals. This means that the price per tonne of raw materials and the price per tonne of methane can be included in your planning, and cultivation processes can be optimised for the farm as a whole and for individual fields.



Slurry

Energy crops

Organic waste



Recycling of residual material and settling accounts.

The integrated raw materials management system in AGRO BioGas has got recycling of residues under control: When the biogas slurry silo has reached its full capacity, the programme displays alternative stores or areas where the slurry could be spread, taking into account the nutrient balance. You can even calculate the required amount of biogas slurry in advance and when the containers are full, quickly see where the slurry can be used. The programme supplies information about locations, cultures and distances so that seasonal requirements of plant husbandry can be taken into account. At the touch of a button, you can find out the exact field that the energy source came from and where the residues are being spread.

All the functions you need for accurate invoicing.

When we were developing AGRO BioGas, we took into account the requirements of all the different parties involved. One thing became particularly clear: Precise invoicing is a central task of plant management. The programme is designed to integrate data from a wide variety of sources (e.g. weighing results, yield data from forage harvesters and slurry application data) and to enter the data directly into the accounts tool in order to generate invoices for the farmers.

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Rechnung Nr: 45678 - Austragung: Biogasgülle

Position	Datum	Nr	Strich Name	Fläche	Maschine	Menge	Preis	Kosten
1	09.08.2007	11170-00	Jugendh.	1,30	TG-Grünland	45,00	2,70	121,50
2	09.08.2007	37090-00	Lennenberg (S)	1,30	TG-Grünland	18,80	2,70	50,76
3	09.08.2007	37310-00	vor dem Haus	0,80	TG-Grünland	7,20	2,70	19,44
4	09.08.2007	11280-00	Koppelplatz 03	0,80	TG-Grünland	12,50	2,70	33,75
5	09.08.2007	37250-00	unter dem Pult	1,80	TG-Grünland	25,10	2,70	67,77
6	09.08.2007	20010-00	Gründerwäld	2,10	TG-Grünland	41,80	2,80	108,96
						180,85		



Out in the field with mobile navigation.

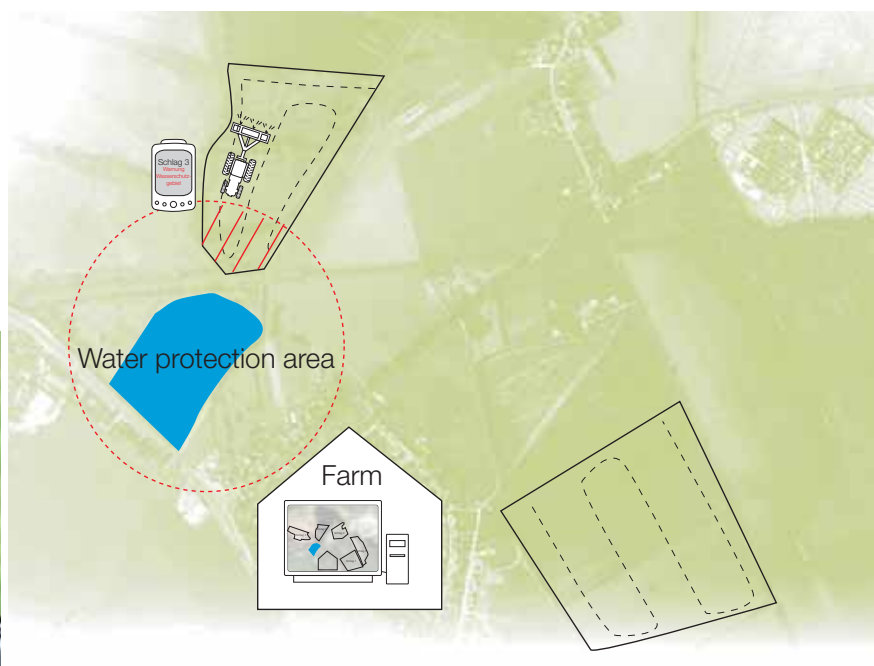
With a mobile navigation system, farmers can take care of field index management, documentation, area management and surveying, soil sampling and scoring while out on the field. The system navigates reliably to each cultivated field in order to minimise search time and error ratios. It displays the current location of the driver, the time he entered the field and the time he leaves it. All activities on the field are recorded, including breaks, time taken to go from one field to the next and transport runs. The system displays all kinds of obstacles, weed infestations, as well as, for example, fields bordering on riverbanks. The result is an exact record of work, which precisely documents where fertiliser was applied and where not, automatically fulfilling all the regulations relating to fertiliser application and crop spraying.



Geo data processing

If you wish, CLAAS Agrosystems will also process and compile geodata for you! Save time and trouble looking for data from different organisations.

We deliver everything from one single source and you can start work immediately!



Administration and proof.

Energy generated from biogas receives generous government subsidies. However, in order to receive a subsidy, farmers must comply with EU documentation requirements. In addition, more and more checks are being carried out.

Who delivered what, how much has been spread and in which fields? AGRO BioGas provides accurate evidence of the sources of energy, the energy produced and the biogas slurry or residues spread, for each farm and for each field.

AGRO BioGas fulfils all statutory documentation requirements including the differentiation between renewable raw materials and energy crops. With the help of the documentation you can clearly prove, for example, that only crops to be used for energy production were sown on set-aside land. And you have clear evidence that no regulations (e.g. water protection) were violated when biogas slurry was applied. Thanks to the built-in graphic elements for planting and spreading, you can achieve a well balanced nutritional composition with no hassle.

A map says more than a thousand charts.

AGRO BioGas presents all the correlated legal and economic data on the areas graphically with exact coordinates. In true-to-scale diagrams, the programme calculates possible changes and presents a selection of solutions in graphic form which you may use as binding variables when drawing up contracts, for example. Protected areas are also shown up graphically so that it is very clear where slurry may not be used.

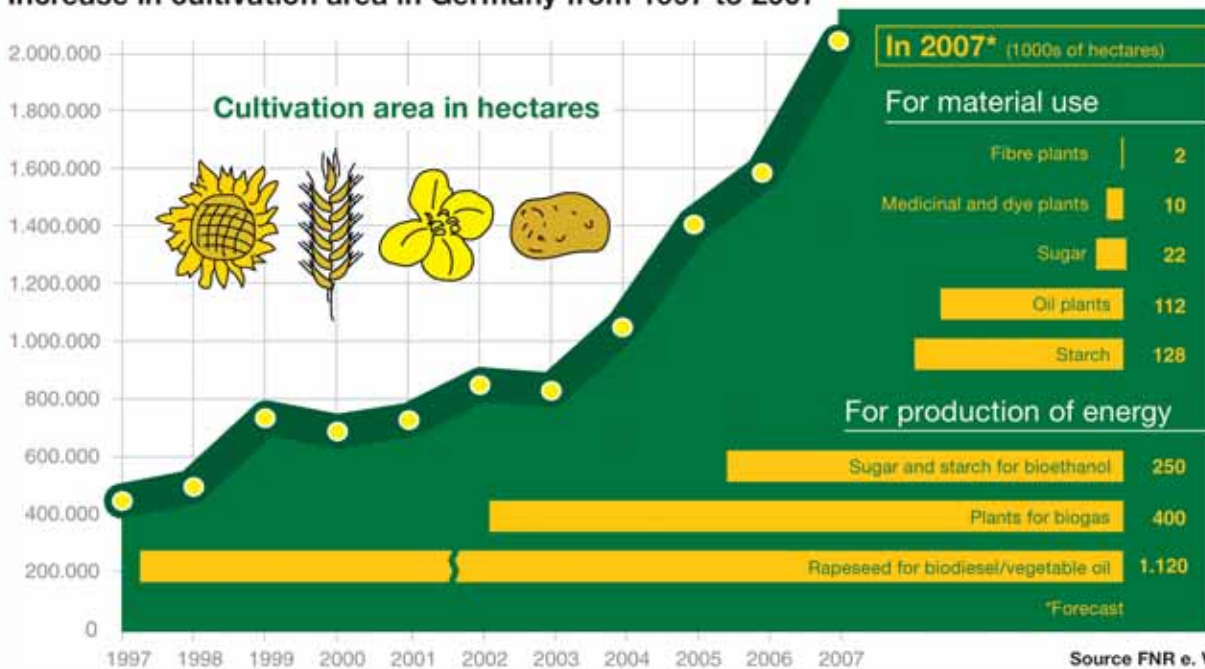
Checklists are an invaluable aid.

The programme reminds you of the mandatory checks you must carry out (leak detection, gas leak tests etc.). This means that you don't have to worry about checks in advance or you can produce evidence quickly and efficiently.



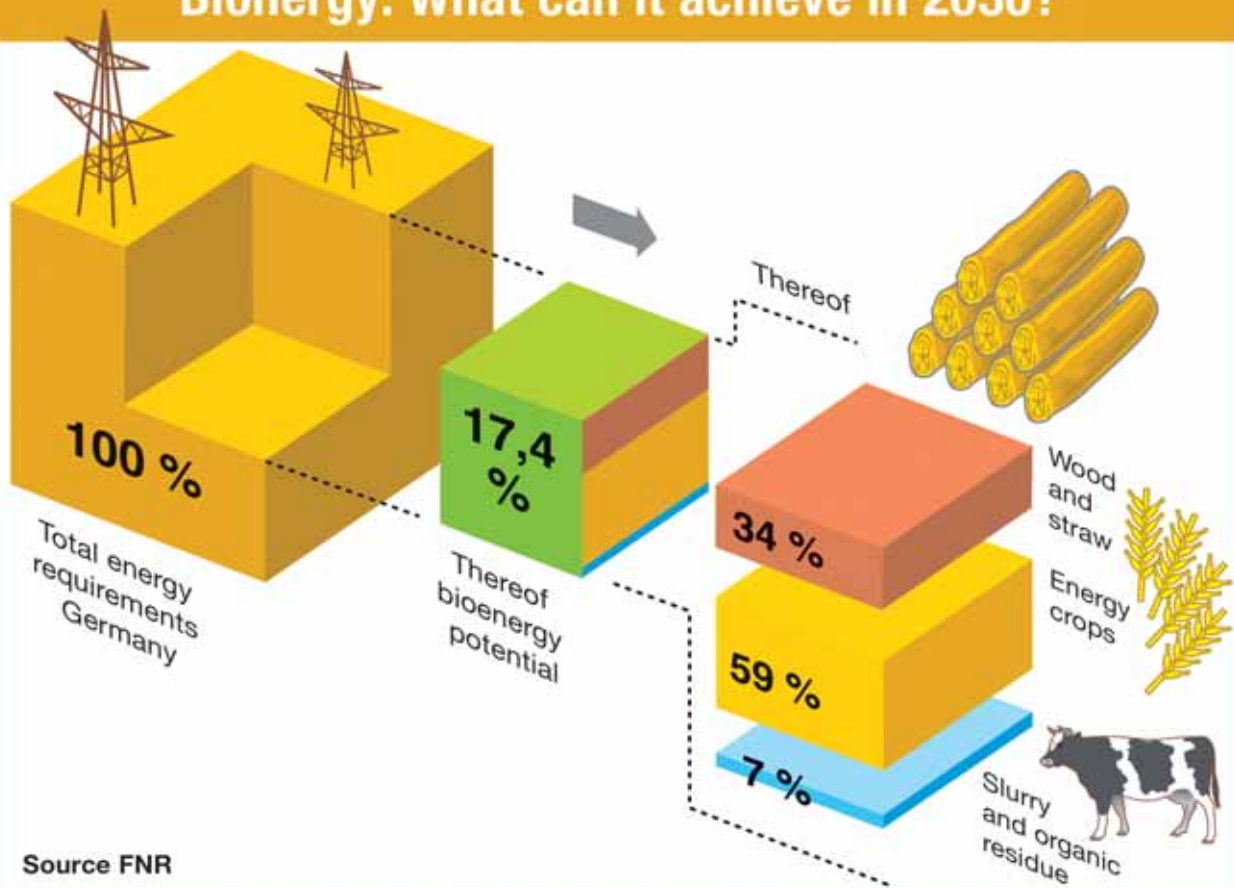
Cultivation of recyclable raw materials at a new record level

Increase in cultivation area in Germany from 1997 to 2007





Bionergy: What can it achieve in 2030?

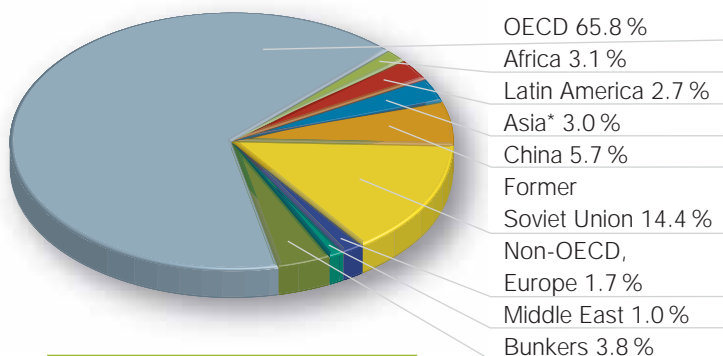


Reduce CO₂ and save fuel.

If the CO₂ balance is incorrect, biogas plants make no sense - especially for the public, but also for authorities. Precise planning is therefore crucial if CO₂ emissions are to be kept to a minimum. Based on fertiliser plans and digital imaging, possible transport routes and capacities can be compared and then optimised. Fertiliser quantities

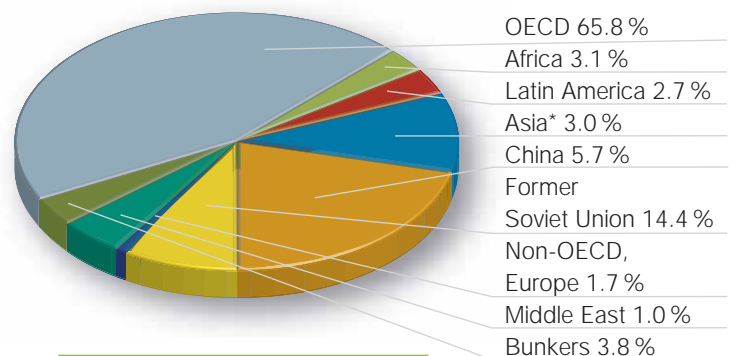
and the destination are always the basis for planning. Topographical data can be more accurately allowed for. The driver is navigated along the shortest and fastest suitable route. This means that, in addition to reducing CO₂ emissions, fuel is also saved - a great source of relief for your budget!

1973



15 640 MT CO₂

2007



28 962 MT CO₂

* Asia excludes China.

Source: © OECD/IEA 2009, International Energy Agency (IEA),
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