

Public goods bonus

A concept for the effective remuneration of agricultural environmental and climate protection services within the eco-schemes of the EU Common Agricultural Policy (CAP) beyond 2020

Developed in cooperation with agriculture, science and administration



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Summary

Public goods bonus - A concept for the effective remuneration of agricultural environmental and climate protection services within the eco-schemes of the EU Common Agricultural Policy (CAP) after 2020

The concept of the public goods bonus of Landcare Germany (Deutscher Verband für Landschaftspflege (DVL)) is based on the principle: **farmers are entrepreneurs**, so environmental services are primarily provided by them if they act as entrepreneurs and can "offer" their services in a manner that is relevant to their income.

The basic principles of **the public goods bonus** were initially developed regionally by the DVL and then **tested and further developed for nationwide application**ⁱ as part of a research and development project.

The public good bonus contains a catalogue of **19 measures from the areas of biodiversity, climate and water protection**. The catalogue of measures comprises the use categories arable land, grassland, special crops and yard gate balances, from which farms can select the appropriate combination of measures for their needs. The measures are explained in more detail in a separate publication¹⁰.

The individual measures of the public goods bonus are scored according to their value for biodiversity, climate and water protection. The overall performance of the company is rewarded by adding up and remunerating the points achieved. In addition, a new **bonus system for a variety of measures** has been developed to promote the diversity of use in the agricultural landscape.

The DVL recommends that **the public goods bonus be used to shape the eco-schemes within the framework of the EU Common Agricultural Policy after 2020 in Germany.** The concept of the public goods bonus is based on the substantive and administrative requirements set by the EU Commission and can help to effectively implement the objectives in environmental and climate protection.

ⁱ The research and development project was supported by the Federal Agency for Nature Conservation (BfN) with funds from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The measures, the evaluation method and the associated remuneration system were revised with the help of agricultural economists and administrative experts.

Status of the Common Agricultural Policy of the EU

Starting point: Greening failed

A core element of the reform of the EU's Common Agricultural Policy (CAP) in 2014 was the introduction of mandatory so-called greening, which would bind direct payments to the provision of environmental services. **Greening is now regarded as a failure**, as it has only resulted in **low environmental performance** and at the same time is associated with a **high administrative burden**. In the current proposals of the European Commission (COM) for the design of the CAP after 2020, greening in its current form is accordingly no longer included. With its current legislative proposal, the COM is formulating the claim that **the CAP should make a greater overall contribution to achieving the environmental and climate objectives in the coming funding period**. To achieve these objectives, the Commission proposes a new "green architecture" in conjunction with a new delivery model to manage the **transition to a performance-based system**.

Eco-schemes: Innovation of future "green architecture"

As a core element of the commission proposal for "green architecture", so-called "**climate and environment (eco-schemes)**" are to be introduced as a new category of direct payments. In Pillar 1, the organic schemes complement the former and now extended cross compliance requirements ("conditionality") and must differ from the "environmental, climate and other management commitments" (previous agri-environmental and climate measures) in Pillar 2. The organic schemes serve exclusively to implement the three specific environmental and climate objectives of the CAP. According to the current state of the CAP negotiations, the programming of the organic schemes is **obligatory for the Member States, but** participation in them is **voluntary for agricultural holdings**. In order to achieve the objectives in environmental and climate protection, **economic incentives** can be offered to farmers* to **participate within the national concretisation of the organic schemes**. The CAP Strategic Plan should pay due attention to administrative simplification.

Proposal: Application of the public goods bonus

As early as 2017, the DVL submitted a proposal with its **concept of the public goods bonus (PGB) on how the current system of agricultural subsidies could be fundamentally reformed in order to achieve a higher remuneration of public services in agriculture**.² Following the presentation of the COM proposal on the design of the CAP after 2020, it was also explained how the PGB concept **could be used to design specifically the eco-schemes when implementing the current legislative proposal**.³ The proposals were based on the example of the federal state of Schleswig-Holstein, where the concept of the public goods bonus was originally developed (see Box 1). In the **present paper**, the proposal to use the public goods bonus **for the implementation of the eco-schemes in Germany is based on the results of a research and development project (R&D project) in which the concept from Schleswig-Holstein was tested with regard to its nationwide applicability and revised accordingly** (see Box 2).

Box 1: The idea of the public goods bonus – preliminary work from Schleswig-Holstein

The public goods bonus is a concept that could be used in future to align the support system of the Common Agricultural Policy according to the principle of "public money for public goods".² The method already developed by the DVL in 2011/12 is based on rewarding agricultural enterprises for the environmental services they have achieved in terms of area, instead of - as has been the case to date - subsidising on a flat rate basis according to the extent of the eligible hectare area. It is based on a point value system for individual farm management measures that generate positive effects in terms of **biodiversity, climate and/or water protection**. The evaluation is so designed that the information required for this purpose can be taken perspectively from the annual application for agricultural subsidies. The overall performance of the farm is rewarded by the points achieved.

The idea of evaluating ecological services provided by agriculture with "eco-points" and, based on this, remunerating them within the framework of EU agricultural policy is not new.⁴ The basic features of the PGB assessment method are based on a point value method which, building on previous assessment approaches, was originally developed for operational biodiversity consulting and certification in Schleswig-Holstein. The point values were validated by field surveys of the field bird indicator and the High Nature Value (HNV) farmland indicator (previous EU mandatory indicators).⁵ In a pilot project with 80 representative practical farms, the evaluation procedure proved to be practicable.⁶ In 2015, the assessment method in cooperation with Prof. Dr. Friedhelm Taube (University of Kiel) was **extended** to include the areas of **climate and water protection services** and subsequently validated again in 2016 through surveys on farms.⁷

The preliminary work from Schleswig-Holstein formed the basis for the R&D project, in which the concept of the public goods bonus was tested for its **nationwide applicability** and further developed in the light of the results obtained (see Box 2)



Box 2: Further development of the public goods bonus at federal level

Within the framework of an R&D¹¹ project entitled "Common Agricultural Policy: Public Money for Public Services – Further Development of a Model for Rewarding Environmental Services of Agriculture in the Common Agricultural Policy (CAP)", the concept of the public goods bonus was further developed with a view to its nationwide applicability. The aim was to develop an **approach that had been successfully tested in agricultural practice and was acceptable to politicians and authorities.**

In detail, the R&D project

1] the PGB method developed and validated in Schleswig-Holstein (see Box 1) was tested for its **Germany-wide applicability** at farm level and in agricultural administration and - where necessary - adapted accordingly. For this purpose

- (a) **the existing PGB measures and their evaluation in different "landscape areas" in Germany were reviewed, modified and further developed.** For this purpose, 93 farm surveys were conducted in test regions with different agricultural structures and farm types in different natural areas of Baden-Württemberg, Saxony and Brandenburg and continuously validated (16 landcare organisations; Tobias Pape, Grünweg office; DVL);
- (b) the previous algorithm of the point value method and the calculation of farm payments was reviewed and adjusted (Prof. Dr. Uwe Latacz-Lohmann & Dr. Gunnar Breustedt, University of Kiel; DVL); 8
- (c) Proposals for the derivation and determination of a monetary point value (€/point) were developed (Prof. Dr. Uwe Latacz-Lohmann & Dr. Gunnar Breustedt, University of Kiel; DVL); 8;
- (d) a **linear point value method with a bonus system for a variety of measures** was newly developed and evaluated with regard to economic effects based on eight differently structured model farms and various variation calculations (Prof. Dr. Uwe Latacz-Lohmann & Dr. Gunnar Breustedt, University of Kiel; DVL)⁸;
- (e) examined the different handling of the Integrated Administration and Control System (IACS) in the federal states (Bundesländer) by means of **surveys in agricultural and environmental administrations to determine** the extent to which the modified PGB measures can actually be reflected in the information stored in IACS and how they can be controlled (Thünen-Institut für Ländliche Räume, Braunschweig);⁹

2] the significance of the PGB concept and its possible **integration into an overall CAP funding architecture after 2020, which is to be newly oriented towards public welfare aspects** (project accompanying working group with representatives of the administration; DVL) and finally ...

3] ... its applicability to the design of the eco-schemes in Germany.

The work of the external experts* was commissioned by the DVL within the framework of the R&D project. The results and recommendations of the expert opinions formed the basis for the successive further development of the PGB method in the course of the project. The external expert reports were based on the status of the PGB concept development at the time of the award of the contract.

¹¹ The R&D project was funded by the Federal Agency for Nature Conservation with funds from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and covered the period from 1 August 2017 to 29 February 2020.

This is how the public goods bonus works

Measures of the public goods bonus

Within the framework of the R&D project, 19 **measures** were identified which are suitable for a nationwide implementation of the concept of the public goods bonus for the design of eco-schemes (Table 1). The PGB measures cover the **use categories arable land, grassland, special crops and the farm-gate balances for nitrogen and phosphorus**. From this list, farmers can select suitable combinations of measures for their farms.

A detailed description of the individual PGB measures can be found in a separate publication in the form of **fact sheets** (PGB fact sheets¹⁰). These contain information on

- Definitions,
- Effects on the objects of protection under consideration,
- References to EU indicators,
- Possible combinations of measures,
- Distinctions to conditionality and measures of the 2nd pillar,
- control and management requirements.

In addition to the PGB measures (Table 1), numerous other measures were examined within the R&D project, but these were not considered (see Box 3). The selection of the nationwide emergency response measures was initially based on the set of measures that was available as a result of the preparatory work in Schleswig-Holstein (see Box 1). Some of these measures turned out to be unsuitable for nationwide uniform application (e.g. specifications on mowing dates). Other measures were newly included because they are important from a national perspective (e.g. orchards, special crops). The measures were selected based on the project-internal expert ratings, which in turn incorporated the results of the validations of the farm assessments from the various test regions (see Box 2).

The PGB measures were selected and defined in such a way that, in the opinion of the DVL, they can be integrated into the existing Integrated Administration and Control System. Most of the AWP measures are already offered in the current funding period as 1st and/or 2nd pillar measures and are therefore already available in IACS or could be integrated into it with little effort. Information on this see in the fact sheets. The PGB measures could be allocated to individual parcels (fields, sections of land) in the funding application by means of simple allocations or additional information (e.g. "tick/cross the box", select additional fields, see currently e.g. Binding for ecological priority areas). **From the perspective of the agricultural enterprises, this would change little in the user interface of the electronic application procedure.**



Table 1: Nationwide measures of the public goods bonus (as eco-schemes) with information on the evaluation (points/ha) as well as the required minimum area percentage [% of the agricultural area (Utilised Agricultural Area (LN))] to obtain the bonus for diversity of measures (for explanations see text; status: 02/2020)

Measure	Points for scope of measures	Minimum area share for bonus Variety of measures
	[Points/ha]	[% of LN (net)]
Field (AL)		
AL 1 Small-scale arable farming	1	10
AL 2 Summer cereals	1	10
AL 3 Legumes and mixtures thereof	2	5
AL 4 Unprocessed stubble cultivators	2	10
AL 5 Flowering areas and strips	10	1
AL 6 Fallow land with self-planting	12	1
AL 7 Abstention from the use of chemical synthetic pesticides and mineral fertilisers	4	5
Grassland (GL)		
GL 1 Small-scale grassland management	1	10
GL 2 Permanent pasture	1	30
GL 3 Willow	2	10
GL 4 Used grass and hem strip	1	10
GL 5 Abstention from the use of chemical synthetic pesticides and mineral fertilizers	4	5
GL 6 Abandonment of organic fertilising	4	5
GL 7 Orchards with grassland use	4	0,5
Special crops (SO)		
SO 1 Alternating management of tramlines	1	10
SO 2 Flowering and beneficial insect strips	3	1
SO 3 Abandonment of chemical synthetic pesticides and mineral fertilisers	8	5
Nutrient balances (HO)c		
HO 1 Farm-gate nitrogen (N) balance (gross)	0-12 points/operation * 0.7 * LN Total	No crediting with the bonus
HO 2 Farm-gate phosphorus (P) balance	0-12 points/operation * 0.7 * LN Total	

a Related to the respective category AL, GL, SO; in case of measure GL 2, deviating from the total LN; superordinate measures are only evaluated for the bonus if the LN of the corresponding measure area AL, GL, SO each accounts for at least 5 % of the total LN (net).

b On surfaces with GL 5

c For the financial remuneration, the multiplication with the balance sheet/operating area and the coefficient 0.7

d The point score is based on the amount of N fertilisers of organic origin produced on the farm (kg N/ha).

e The point evaluation is differentiated according to the operational soil content P-classes.

Note to c-e: For the valuation and financial remuneration of the yard gate balance sheets see also PGB descriptions¹⁰

Box 3: Requirements for public goods bonus measures

Uniform and simple nationwide: Measures of the public goods bonus must be uniform nationwide, be as easy to implement and administer as possible, and it must be possible to differentiate between them.

Connectivity: PGB measures should be suitable for inclusion in the existing IACS, so that administrations and applicants do not need to switch to a fundamentally new agricultural administration system. Minor adjustments to IACS may be necessary, e.g. through new definitions.

Annuitiy: In analogy to the previous payment system for direct payments, it must be possible to implement the measures on an annual basis or to reapply for them each year. For certain effective measures, however, it is desirable and must therefore be possible for applicants to commit themselves for several years (see PGB fact sheets¹⁰).

Targeting: The PGB measures must be suitable for making positive contributions at farm level to the protected goods biodiversity, climate and/or water. Individual measures do not contribute equally to these target areas, but they are an important part of the catalogue of measures (see also next point).

Enabling easy access for companies: The PGB measures should enable as many farmers as possible to participate and thus achieve a high level of land penetration nationwide. The PGB catalogue of measures therefore refers to arable land, grassland and special crop areas. In addition to "dark green" measures, "light green" measures are also offered, although these are rated much lower (see Table 1).

Include existing services: Companies should also be able to incorporate their existing landscape structures and existing services. The catalogue of measures therefore also contains parameters for the individual farm landscape situation (small-scale arable/grassland management).

Better than in the past: PGB measures should also bring about comprehensible changes compared to the current situation. A positive (point) assessment and thus remuneration of the measures is therefore above current professional practice and legal requirements or the minimum criteria defined in the conditionality (see "Demarcation of the PGB from conditionality").

No replacement of second pillar measures: Measures which pursue very specific technical objectives with regard to the three objects of protection under consideration are not eligible for the PGB method (e.g. single species protection). However, they are absolutely necessary and must be supplemented by appropriate measures (2nd pillar CAP, Länder programmes).

Combinations necessary: It must be possible to combine PGB measures and special Pillar 2 measures (e.g. contractual nature conservation) on a single site without overlapping in content.

Organic farming integrated: Farms that operate according to the guidelines of organic farming are integrated into the PGB concept with their area-related biodiversity, climate and water protection services. For PGB measures, which are prescribed by the organic farming guidelines, organic farms are therefore not eligible for additional subsidies under the 2nd pillar (exclusion of double subsidies, concerns PGB measures "Abstaining from chemical synthetic pesticides and mineral fertilizers", see Table 1).

Evaluation and remuneration of the public goods bonus measures

The evaluation and remuneration of the measures of the public goods bonus is based on the method originally derived from field evaluations in Schleswig-Holstein and further developed for nationwide application within the framework of the R&D project (see Boxes 1 and 2). Economic analyses and model calculations were carried out for the adjustments and various calculation approaches were tested. In order to select a reward system which is suitable for application in the eco-schemes, project-specific requirements were formulated as in the identification of measures (see Box 4).

Scoring: The basis for the derivation of a nationwide uniform assessment of the PGB measures was initially the scale of points available from the preparatory work in Schleswig-Holstein (see Box 1). After the expert ratings and the results of the validations from the various test regions (see Box 2), the scale also proved to be appropriate for the nationwide PGB set of measures. The twelve-point scale (0 - 12 points) was therefore retained. The points that can be achieved for each measure reflect the respective overall performance for the protected goods under consideration (biodiversity, climate, water).

According to the original PGB proposal, the individual area-related measures were evaluated on the basis of area shares with class levels (e.g. 10 - 20 % of the area results in 2 points).⁷ In many cases, small area shares were evaluated disproportionately higher, i.e. with increasing area shares, fewer points could be obtained in relative terms (degressive evaluation). In the analyses and model calculations of the R&D project, this evaluation method proved to be unsuitable for nationwide application. As a new reference value the area of the individual measure was introduced, which is evaluated linearly with points (points per ha LN net). In the case of the yard gate balances the points evaluation refers as before to the total farm area (LN net) and additionally considers covariates (see Table 1).

In the case of combinations of measures, the points of the different measures on the respective area are added up. The **total number of points per holding is calculated** by adding up the points obtained for the individual measures. The total number of points can be increased by a **bonus for diversity of measures** (Table 2). The calculation of the actual public goods bonus, i.e. the remuneration per farm, is finally done by multiplying the total number of points by a **fixed monetary point value (€/point)**. Deviating from the original concept for the public-goods bonus (see Box 1), it is proposed to keep the point value constant over the entire funding period, based on the results of the R&D project. This increases the planning security for the agricultural enterprises and facilitates budget management (see below, section "Classification in the 'Green Architecture'"). However, it should be possible to adjust the monetary point value depending on the achievement of objectives, for example in the context of an intermediate/halftime evaluation.

"Bonus system for diversity of measures": This instrument was developed as a new central element of PGB remuneration. The bonus aims to promote diversity of use in the agricultural landscape and at the same time to safeguard the requirements of the remuneration system (see Box 4). When calculating the bonus, only measures with a certain minimum area share in the respective use category (arable land, grassland, special crops) are taken into account (Table 1). In addition, the use category in question must have a minimum area percentage of 5% of the farm area. The bonus is granted as a point supplement to the total number of points (points/total holding). It is calculated as a percentage of the total number of points, whereby higher percentages are estimated linearly with increasing diversity of measures (entry level: four measures, one percentage point more for each additional measure, see Table 2 and example of application below).

Table 2: Bonus system for diversity of measures

Number of different measures on the farm	4	5	6	7	8	9	10	...
Supplement in % of total points to total points	10	11	12	13	14	15	16	...

The PGB fee system can **be integrated into the existing electronic application and administration system** by programming comparatively simple algorithms. A "PGB calculator" could be offered on the user interface for online application, with which applicants can "play through" and compare different variants.

Box 4: Requirements for the method of valuation and remuneration of the public goods bonus

The scoring and the remuneration of the measures of the **public good bonus are based on the services provided for the protected goods under consideration**. The payments for PGB measures may therefore deviate from the premium levels that result from "classical" calculations for compensation payments (revenue and cost difference calculations).

The PGB fee system is based on the fact that the scope of the measures implemented in each case depends on individual farm decisions and does not have to be oriented towards the fulfilment of minimum requirements (as is currently the case in greening). For this reason, no "caps" on the scope of measures are envisaged.

The evaluation and remuneration method of the public goods bonus is to **allow the most even penetration of land**. This means that different types of farms in Germany may neither be disadvantaged nor given preferential treatment on account of the method used (equal treatment of farms). In absolute terms, however, farms with a large area can generate higher payments under the PGB concept, since the public goods bonus evaluates and rewards environmental and climate performance related to the area. However, this does not result in a general advantage for larger farms, as the payments are linked to the scope of the corresponding PGB measures.

In order to achieve the public interest objectives mentioned, a **(marginal) incentive effect is conducive**. In the PGB fee system, this is designed by integrating the bonus system in such a way that even small-scale measures have an impact on income and at the same time the implementation of as many different types of measures as possible is attractive.

The remuneration system must be as **robust** as possible **against strategic adjustments** (e.g. land lease) and possibilities of "greenwashing". This is to be achieved through the high evaluation of demanding measures and, above all, the integration of the "bonus system for diversity of measures".

In addition to the broad range of measures, the point evaluation of the individual measures and the bonus for diversity of measures are the central control variables for achieving and securing the objectives of the public goods bonus. Only if "light green" and "dark green" measures are assessed based on their actual performance and the bonus system is additionally applied, the principle of "public money for public goods" can be effectively implemented and "greenwashing" through ineffective or overvalued measures can be prevented. Furthermore, a minimum number of measures is required for the bonus system to be applied. **The proposed PGB measures with their assessments and the associated bonus system for a variety of measures are accordingly to be regarded as a coordinated overall system that cannot be changed at will.**

In summary, the calculation of the single farm payment involves the following four steps (see also the application example in Table 3)

1. point evaluation of the individual PGB measures (Table 1): *Points/individual measure*
2. summing up the points of the individual measures for the total operation: *Total points/operation*
3. points supplement on the total number of points for action bonus (Table 2): *Total points/operation + points action bonus*
4. multiplication of the total number of points (including bonus, if applicable) by monetary point value (€/point): *(total points/operation + points measure bonus) * €/point*

Application example and operational effects

In order to examine how the further developed remuneration system of the public goods bonus looks from an economic point of view for different operating situations in Germany, **profitability analyses and model calculations** were carried out as part of the R&D project (see Box 2). Simplifying assumptions had to be made for these analyses due to the complex interrelationships. For example, it was assumed that operational decisions to implement PGB measures are based on purely economic criteria, even though in reality other factors often play a major role in environmentally relevant behaviour (including personal attitudes and social environment). With regard to the "bonus system for a variety of measures" it was also assumed that the area of an additional measure would be optimised from a company's point of view in such a way that in each case the minimum area share for entering the next bonus level would be realised (see Tables 1 and 2).

Table 3 illustrates, using a fictitious model farm as an example, which PGB payment can be generated under the above assumptions for PGB measures that are also selected as examples. The farm is a 210 ha conventionally managed mixed farm with a focus on arable farming. In the initial situation, 130 ha are used for wintering. In addition, 80 ha of grassland is used with a herd of suckler cows, 50 ha of which are used as pasture and 30 ha as mowing pasture. The calculation was based on a remuneration of 50 €/point.



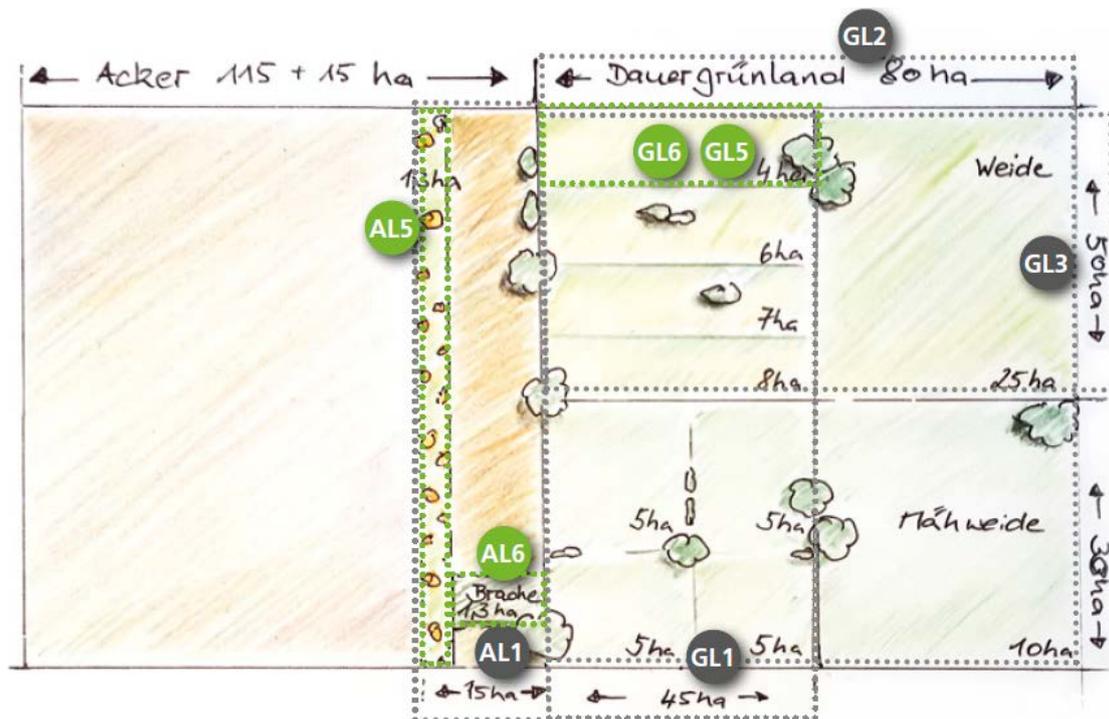


Table 3: Example of the implementation of eight PGB measures in a model farm with calculation of the farm payment (mixed farm, 210 ha, focus on arable farming, conventional farming)

Measure	Points/ ha	Area of measures [ha]	Points for action area
Measures that do not cause any adaptation costs in model operation (initial situation):			
AL 1 Small-scale arable farming (fields < 10ha)	1	15	15
GL 1 Small-scale grassland management (fields <10ha)	1	45	45
GL 2 Permanent pasture	1	80	80
GL 3 Willow	2	50	100
Measures which, in this example, require cost-effective land use adjustments:			
AL 5 Flowering areas and strips	10	1,3	13
AL 6 Fallow land with self-planting	12	1,3	15,6
GL 5 Abstention from the use of synthetic chemical pesticides and mineral fertilisers	4	4	16
GL 6 Abstention from organic fertilisation	4	4	16
Sum of the points			300.6 points
Bonus for diversity of measures: 8 measures, 14 % bonus			42.1 points
Total points incl. bonus			342.7 points
Operating payment at 50 € per point			17.135,00 €
Farm payment per ha of area (farm size 210 ha)			81,59 €/ha

Due to its assumed landscape situation and operational orientation, the model operation can already score points in the initial state for the measures shown in Table 3 (grey background). As these measures also fulfil the minimum requirements for the "Bonus for diversity of measures" due to their area shares (cf. Table 1), the 10 % bonus can also be credited for these measures without further adjustments. The payments of the public goods bonus, which are calculated for the assumed initial state, are fully effective in terms of income, as the farm does not incur any adjustment costs. Furthermore and in addition to the public goods bonus the farm should also be allowed to combine it with payments for second pillar measures in order to "qualify" the corresponding PGB measures further through special measures (see Box 3 and the chapter on "Classification in the "green architecture").

In addition to the points from the above-mentioned measures, the model company decides to implement four further measures and thus generate additional points:

- AL 5 flowering areas and strips (1,3 ha),
- AL 6 Fallow land with self-planting (1.3 ha),
- GL 5 Abstention from chemical synthetic pesticides and mineral fertilizers (4 ha)
- GL 6 Abandonment of organic fertilization (4 ha) of grassland with GL 5.

Since the area covered by these four measures in turn each meets the minimum requirements for the bonus for diversity of measures (see Table 1.), the bonus can be credited for a total of eight measures, which increases the total premium accordingly (see Table 3).

For the operational decision whether one or more PGB additional measures are economically sensible, however, it is not (solely) the additional premium income that is decisive, but the income effect that remains as "profit" after deduction of all adjustment costs. Therefore, in the model calculations and economic analyses, marginal revenue and marginal costs were compared for different operating situations when considering PGB measures that are introduced in addition to the crediting of the actual situation (for details on the calculations see Latacz-Lohmann & Breustedt 2019 and 2020⁸). **The results of these analyses can be summarised as follows:**

The new nationwide point value procedure including a bonus system for a diversity of measures contains an incentive to implement diverse PGB measures. Thanks to the bonus, it can make economic sense to implement a measure in a package with other measures that would not be economically viable on its own. As the number of measures increases, both the bonus income and the profit per hectare of farmland increase.

The farm organisation has a major influence on the premium income and the income effect of the PGB payments. In principle, it can be assumed that versatile mixed farms, farms with low farming intensity and organic farms can achieve a higher premium income than highly specialised and intensively managed conventional farms. For the former farms, the premium has a higher income effect due to lower adaptation costs.

The PGB fee system appears to be relatively robust against tactical adjustment reactions, even if these cannot be completely ruled out in advance.

According to the model calculations, the incentive system of the PGB fee model is also relatively robust to changes in costs (caused by changes in product prices, revenues, contribution margins, etc.).

The new point value method including a bonus system for a variety of measures proved to be well calibrated to promote organic farms. In addition, it provides an effective incentive to implement further PGB measures that go beyond the requirements of the organic farming guidelines.

A fixed monetary point value of 50 €/point was assumed for the model calculations. According to the project results, this amount can provide an effective incentive for the implantation of a wide range of measures without systematically (not target-oriented) disadvantaging or favouring individual farms.

Furthermore, it can be assumed that environmental pricing in the framework of the public goods bonus will contribute to making agricultural enterprises more aware of environmental issues than in the past and to fundamentally rethinking their environmental behaviour.



Classification of the public goods bonus in "green architecture"

Suitability of the public goods bonus for the design of the eco-schemes in Germany

With the eco-schemes, a new instrument is to be introduced into the CAP support system, with which a part of the direct payments is to be linked more strongly than before to environmentally and climate-related public services provided by agriculture and is to be rewarded accordingly. The support is to be granted in the form of an annual payment and may also be paid as an additional payment ("top up") to basic income support with an incentive component. In this respect, organic schemes also offer the opportunity to gradually orientate the CAP support system of the first pillar further towards public welfare objectives, e.g. agricultural environmental and climate protection.

For the first time farmers have the opportunity to earn an income within the framework of the first pillar of the CAP support system by also providing services for environmental, nature and/or climate protection objectives. In contrast to the environment-related measures of the 2nd pillar, where "compensation payments" must be calculated strictly according to the amount of yield loss or additional expenditure, organic schemes offer the possibility of an incentive effect in payments. In this way, the environmental services provided on the farm could be evaluated and paid accordingly, in accordance with the principle of the public goods bonus.

In this light, the proposal of the commission with the eco-schemes provides a suitable framework for implementing the concept of the public goods bonus.

The general requirements for organic schemes contained in the COM proposal should be taken into account accordingly. The budgetary requirements will not be discussed further below. Detailed proposals for implementation have been published, for example, by the Scientific Advisory Council for Agricultural Policy, Food and Consumer Health Protection at the BMEL (WBAE 2019: 11). In the following, indications are given as to the basic principles according to which the eco-schemes can be distinguished from the GAEC standards of conditionality (GAEC: "Good agricultural and ecological condition") and the "Environmental, climate and other management obligations" (AECC) of the 2nd pillar when applying PGB. The presentations are based on considerations that have already been derived in more detailed form for the conditions in Schleswig-Holstein.³

Differentiation of the public goods bonus from conditionality

The COM proposal of the new 'Green Architecture' requires a demarcation between eco-schemes and GAEC standards of conditionality. The GAEC standards for which there may be overlaps with the LBP measures as eco-schemes are listed in Table 4. Whether and how delimitations are necessary depends on the final specifications or definitions of conditionality. **Overlaps between the GAEC standards and PGB measures (as eco-schemes) can be excluded if the PGB measures are only remunerated above the requirements for the GAEC standards.**

Table 4: Possible overlaps between the content of LBP measures as eco-schemes (see Table 1) and the GAEC standards of conditionality

Requirements Conditionality	PGB measures as eco-schemes
GAEC 1 Percentage for the maintenance of permanent pasture	GL 2 Permanent pasture
GAEC 4 Creation of buffer strips along water-courses	AL 5 Flowering areas, strips AL 6 Fallow land with self-planting
GAEC 5 Operational sustainability instrument	HO 1 Farm-gate nitrogen (N) balance (gross) HO 2 Farm-gate phosphorus (P) balance
GAEC 9 Minimum proportion of non-productive landscape features or areas	AL 5 Flowering areas, strips AL 6 Fallow land with self-planting SO 2 Flowering and beneficial insect strips
GAEC 10 Prohibition of conversion/ploughing in Natura 2000 sites	GL 2 Permanent pasture

Differentiation of the public goods bonus from "environmental, climate and other management obligations" (2nd pillar)

According to the COM proposal, the measures of the public goods bonus as eco-schemes are to be distinguished not only from conditionality but also from the future "environmental, climate and other management obligations" of the Länder.

Targeted individual measures from the second pillar which are necessary to achieve specific protection objectives are not covered by the evaluation procedure for the public goods bonus. Areas of measures that pursue specific objectives and/or are particularly relevant in certain regions/scapes would thus be programmed as AECC within the 2nd pillar in addition to the PGB measures/organic schemes (for examples see Table 5). Within the AECC, a distinction is made between

Individual measures that would be "saddled up" as additional measures on areas with PGB measures without overlapping in content (e.g. late mowing as AECC on grassland areas with "PGB fertilizer waiver", GL 5 and GL 6) and

Types of measures which, due to overlaps in content, require exclusion of areas with AWP measures, i.e. do not allow combinations with AWP measures on the same area (e.g. success-oriented AWPs for the conservation of species-rich grassland).

A special consideration applies to organic farming: The PGB measures "Abandonment of chemical synthetic plant protection products and mineral fertilizers" (AL 7, GL 5, SO 3; see Table 1) remunerate central management requirements of the organic farming guidelines within the organic regulations (see Box 3). Accordingly, remuneration of organic farming for these services would not be permitted in parallel within the framework of the AECC. However, additional subsidies for organic farms can still

be granted under the second pillar, for example for the phase of initial conversion and for other public services provided by organic agriculture (beyond biodiversity, climate and water protection).

Table 5: Examples of Pillar 2 ACAs supplementing PGB measures (see Table 1) as 1st pillar eco-schemes

	1st pillar PGB measures as eco-schemes	2nd pillar supplementary AECC
AL	AL 1 Small-scale arable farming AL 2 Summer cereals AL 3 Legumes and mixtures thereof AL 4 Unprocessed stubble cultivators AL 5 Flowering areas and strips AL 6 Fallow land with self-planting AL 7 Abstention from the use of chemical synthetic pesticides and mineral fertilisers	Abstention from organic fertilization conversion of arable land into grassland Cultivation of rare crop varieties Biotope measures, e.g. creation and maintenance of hedges or small water bodies Special regional species protection programmes, e.g. for field hamster, ortolan, marsh harrier ...
GL	GL 1 Small-scale grassland management GL 2 Permanent pasture GL 3 Willow GL 4 Used grass and hem strip GL 5 Abstention from the use of synthetic chemical pesticides and mineral fertilisers GL 6 Abstention from organic fertilisation GL 7 Orchards with grassland use	specifications on stocking density, grazing periods, etc. on pastureland Results-oriented grassland management Special upgrading measures, e.g. transfer of mown material, new sowing (Regio seed) Rewetting of organic soils Avoidance of towing and rolling with indication of the blocking period Late mowing with preset cutting time Relay mowing Programs with special mowing technique Special regional species protection programmes, e.g. for meadow birds, orchids Biotope measures, e.g. creation and maintenance of hedges or small water bodies ...
SO	SO1 Alternating management of tramlines SO 2 Flowering and beneficial insect strips SO 3 Abandonment of chemical synthetic pesticides and mineral fertilisers	Viticulture in steep and terraced vineyards Biotope measures, e.g. reconstruction of stone walls in steep vineyard sites ...

Conclusions and outlook

According to the results of the R&D project, the concept of the public goods bonus represents a practical and administrable implementation model for rewarding ecological public welfare services in agriculture based on the performance within the organic regulations of the 1st pillar.

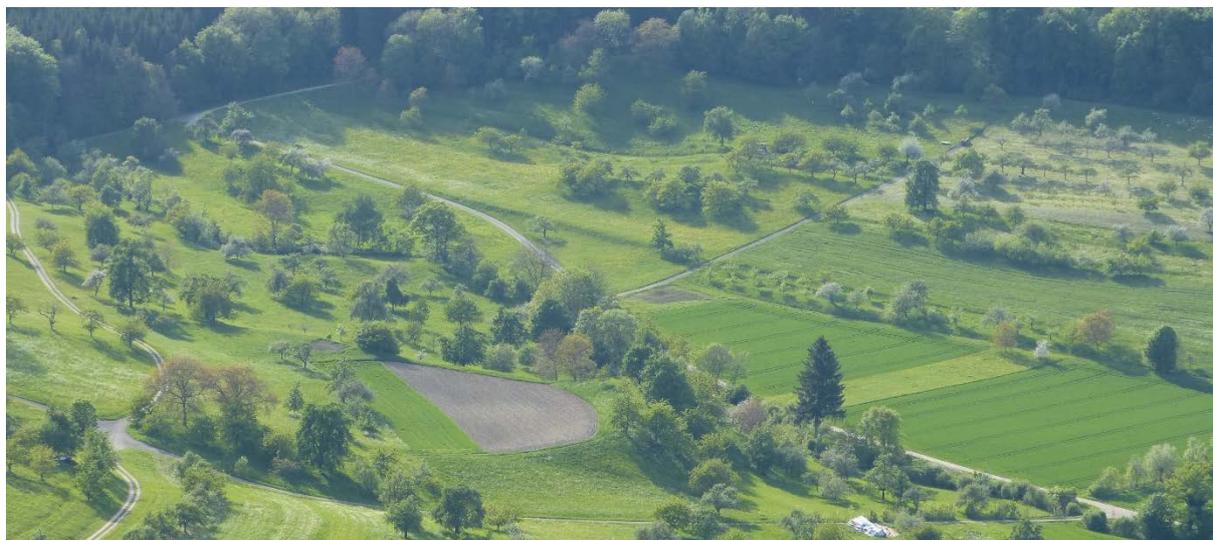
The point evaluation and the (voluntary) "bonus system for diversity of measures" are central control parameters in this context. They guarantee a set of qualified measures, which would have to be supplemented by further special contractual nature conservation and AECC offers. The PGB concept is based on the principle that not the lost benefits and/or additional costs should be compensated, but measurable environmental performance. According to the results of the economic analyses in the R&D project, farmers have the opportunity to tap into an additional source of income by implementing PGB measures (as eco-schemes) and thus, if necessary, to set up their own business branch in this area.

The COM proposal on the future "green architecture" of the CAP gives the Member States room for manoeuvre in the design of conditionality, eco-schemes and the AECC¹¹. Depending on the priorities set, corresponding effects on budget allocations must be taken into account. **The proposed application of the PGB concept implies a sufficiently strong budget allocation in the support area of the eco-schemes.** This is particularly necessary if – as envisaged in the PGB model – not only existing environmental services but also, and above all, necessary changes or effects are to be rewarded.

The financial leeway created by setting priorities within the second pillar eco-schemes (e.g. by integrating fertiliser renunciation into the eco-schemes) can be used, among other things, for sophisticated special AECCs and the expansion of urgently needed accompanying advice.

Models that include a performance-oriented and sophisticated design of the eco-schemes can result in redistribution of funds between individual regions. However, the wide range of PGB measures can ensure that farms in different region-specific situations can benefit from measures and thus also from rewards.

The concept of the public goods bonus has been continuously developed since the first drafting of the basic ideas. The present paper marks the current final stage of work based on the R&D project. Since the final design of the COM proposals for a regulation on the new "green architecture" of the CAP are still being negotiated in 2020, formal adjustments may still be necessary to establish the public goods bonus as an eco-regulation, although these must take account of the basic requirements of the PGB model (see Boxes 3 and 4).



End marks

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Table 1: Nationwide measures of the public goods bonus (as eco-schemes) with information on the evaluation (points/ha) as well as the required minimum area percentage [% of the agricultural area (Utilised Agricultural Area (LN))] to obtain the bonus for diversity of measures (for explanations see text; status: 02/2020)

Table 2: Bonus system for diversity of measures

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Imprint

Publisher: Landcare Germany. Deutscher Verband für Landschaftspflege (DVL) e. V.

Text: Corinna Friedrich, Sönke Beckmann, Uwe Dierking, Dr. Helge Neumann, Dr. Jürgen Metzner

Photos: Title, p. 5, p.7: Helge Neumann/DVL, p.19: Tobias Pape/büro grünweg. others: Peter Roggenthin

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Suggested citation: Deutscher Verband für Landschaftspflege (DVL) e. V. (Ed.) (2020): Public goods bonus. A concept for the effective remuneration of agricultural environmental and climate protection services within the eco-schemes of the EU Common Agricultural Policy (CAP) beyond 2020. Developed in cooperation with agriculture, science and administration DVL, Ansbach.

Supported by the Federal Agency for Nature Conservation (BfN) with funds from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The paper reflects the views and opinions of the recipient of the grant and does not necessarily agree with those of the funding body.

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