









# Sustainable Networks for the Energetic Use of Lignocellulosic Biomass in South East Europe

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#### 1 Methodology

The AoI (Area of Intervention) specific checklists were derived from the Transnational Innovation Road Map and Research Agenda delivered by BOKU for the improvement of the defined (regional) biomass SCORPs.

The checklist, as the roadmap where divided into categories such as:

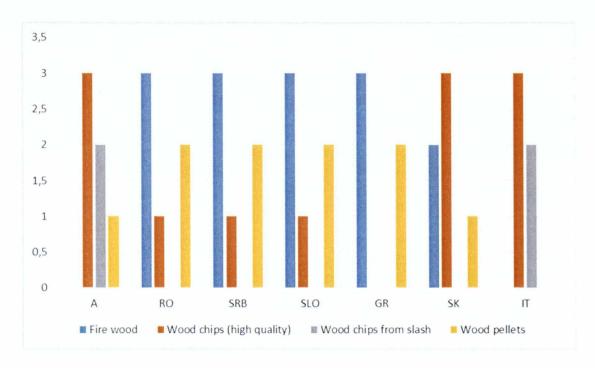
- 1. Introduce new and expand existing innovation networks in SEE
- 2. Improve process and customer orientation
- 3. Reduce the energy input in the supply chain
- 4. Store biofuels
- 5. Improve material characteristics
- 6. Improve forest fuel logistic concepts
- 7. Expand the resource basis for bioenergy generation
- 8. Deal with technical/ecological challenges
- 9. Cooperation

Each region received a template of the checklist and was instructed to follow the below stated steps:

- Indication of the region's SCORPs defined in previous steps (production of fire wood, wood pellets and wood chips, either premium/high quality or from slash originating) depending on the priority to be given (1st, 2nd or 3rd).
- E.g. Styria, Slovakia and South Tyrol indicated wood chips as their 1<sup>st</sup> priority SCORP in contrast to Romania, Serbia, Slovenia and Western Macedonia which indicated fire wood as their 1<sup>st</sup> priority.
- Evaluation of each category (1-9) of each SCORP (fire wood, pellets and wood chips) by giving "low", "moderate", "high" or "not at all" characterization to each action (Annex I).

### 2 Analysis of checklists

One of the results shows the priority of SCORPS in the participating regions. As depicted in the next graph the production of wood logs/fire wood and SCORPS connected to this kind of end product have the **first priority** in four regions (Romania, Serbia, Slovenia and Western Macedonia). SCORPS dedicated to pellet production were identified as **second priority** area in four regions (Romania, Serbia, Slovenia and Western Macedonia). Wood pellets and fire wood were not considered as relevant only in South Tyrol. High quality wood chips were identified as first priority in three countries (Styria, South Tyrol and Slovakia). Wood chips originating from slash were a second priority only in Styria and in South Tyrol. Wood chips in general were not identified as relevant only in Greece. SCORPS connected to production of high quality wood chips were identified as **third priority** in three countries (Romania, Serbia and Slovenia). These selected priorities show also the status of market development in the participating regions.



Graph 1: Relevance of different SCORPS identified by participating regions

Note: Mark 3 was given to the SCORPS with "first priority", 2 for "second priority" and 1 for "third priority"

The importance of the selected categories (1-9) is interpreted by region but also by type of SCORP. The complete results per category, selected SCORP and region can be found below.

#### Analysis per category

Introduce new and expand existing innovation networks in SEE	Priority of action
All partners expressed significant interest to <i>enhance adaption and implementation of best practices in the forest fuel supply chain</i> (Exception - low interest for Styria regarding wood pellets).	moderate high

Improve process and customer orientation	Priority of action
The Automatic round wood takeover at biomass trade	
centres it is not an interesting activity for the most partners	moderate not at all
(Exception – high interest for Styria regarding premium wood	

chips).		
As well as Enabling the possibility for customers to pick up biomass outside the opening hours of biomass trade centres or similar retailers was not seen as a priority for the most	low	not at all
partners		

Store biofuels	Priority of action					
All partners expressed some interest for <i>Improving</i> storage properties of biomass fuels at consumer as well as for	high	moderate	low			
Increase the knowledge of long-term storage of biomass	high	moderate	low			

Improve material characteristics	Priority of action				
<b>Torrefaction</b> , was not seen as a priority at all or at least as a moderate-low priority.	not at all	low	moderate		

Improve forest fuel logistic concepts	Priority of action
Increase the use of the railway for forest fuel transport and	not at all low moderate
Use inland water way for forest fuel transport if possible was not at all a priority or at least a moderate priority	moderate not at all

Expand the resource basis for bioenergy generation	Priority of action
Market barriers should be eliminated by uniform quality standards and the increasing need for resources should be served by an extension of the usable feedstock was seen as of high interest for almost all partners	high moderate

#### Analysis per selected SCORP

#### Fire wood

#### Results per SCORP

- All partners agreed that stimulating the use of national competencies and enhancing the adaption and implementation of best practices in the forest fuel supply chain should be of considerable priority.
- Improving the storage properties of biomass fuels at the consumer was identified as of low priority as well as the development of new methods for easily measuring quality characteristics.
- All partners agreed that **market barriers** should be eliminated in order to expand the resource basis for bioenergy generation.
- Low interest was shown for improving harvesting technologies to provide additional assortments for energetic use.

And specific checklists derived from the Innovation roadmap for the Improvement of the defined blomass  SCORPs  Score Sc								
Select the region (from drop-down list)	Romenia	Serbia First	Slovenia	Macedonia	Slovakia			
Indicate the priority	priority	priority	priority	priority	priority	No.		
Select the chosen SCORPs of your region	Fire wood	Fire wood	Fire wood	Fire wood	Fire wood			
ndicate the priority of the actions from the drop down ist below as "high", "moderate", "low" or "not at all".								
Introduce new and expand existing innovation networks in SEE					Fig			
Promote international R&D collaboration itimulate use of national competencies	Mgh	low	noderate	moderate	moderate moderate			
enhance adaption and implementation of best practices in the forest fuel supply chain	Mah	140	-	No	moderate			
Improve process and customer orientation			Description of the last of the					
Use of online tools for selling forest fuel assortments	38.00	08835	THE					
online information/ordering platform for biomass, Biomass Trading Geo Portal)	Mgh	notatal		moderate	low			
ncrease the use of ICT within all processes	Mah	necotal	moderate	moderate	moderate			
Automatic round wood takeover at biomass trade sentres	mot at all	not at of	moderate	Per te don-	moderate			
Enabling the possibility for customers to pick up slomass outside the opening hours of biomass trade tentres or similar retailers	mot set all	notated	moderate	low	low			
ntroduce trademarks	low	moderate	moderate	moderate	low			
nterest in biomass trade centres	moderate	moderate	Man	low	Nun			
Reduce the energy input in the supply chain			Mark and					
Reduction of energy input in processing biomass (e.g. chipping)	Meh	low	low	low	Neh			
ncrease tool life and extend periodicity of maintenance to reduce overall energy input over the life time	moderate	moderate	nes et all	moderate	low			
Apply economic methods to determine optimal	200	moderate	tow	low	Net			
processing with reduced energy input Reduction of energy consumption in forest fuel ogistics	Ngh	low	low	low	No			
Store biofuels				Marie v	PHI CHARLES AND			
reproving storage properties of biomass fuels at producer/trader	low	low	moderate	low	100			
improving storage properties of biomass fuels at consumer	low	low	low	low	moderate			
ncrease the knowledge of long-term storage of plomass	low	low	moderate	low	100			
itudy self-ignition of stored materials	low	not at all	not at oil	notatel	low			
Improve meterial characteristics	E TO SHOW	S. SARTO						
Develop new methods for easily measuring quality characteristics	moderate	low	low	low	moderate			
Orying of forest fuels  I. Technologies	moderate	No.	not at all	low	moderate			
Economic calculations Lincorporation in efficient supply chain	Nah Nah	Ngh	moderate low	low	moderate			
orrefaction	moderate	notatal	not at all	not at all	low			
eparation of undesired contaminations	Mgh	notated	low	low	moderate			
Improve forest fuel logistic concepts								
ncrease the use of the railway for forest fuel transport ise inland water way for forest fuel transport if	THE REAL PROPERTY.	moderate	Adjunct	med at all	moderate			
ossible ieek for multimodal solution for forest fuel transport	To Mark III	low	low	low	moderate	-		
ncrease the number and capability of biomass erminals	Meh	moderate	moderate	low	moderate			
dalance intermediate storage against the connected extra costs	Non	low	low	notetali	moderate			
Optimize location and capacity of comminution	low	motorcal	low	low	moderate			
Develop methods to reduce empty drives Develop new types of containers or adapt existing	moderate	not et all	moderate	moderate	moderate	-		
container types according to customer needs and eeds tock properties	low	notatali	low	low	10			
ncrease the use of a system enabling delivery of wood thips (blow into storage) similar to pellets	not at all	mot at all	extetal	notatel	low	- 11		
studying the interaction of different supply chains to each other	Man	notatel	moderate	low	moderate			
Expend the resource basis for bloenergy generation					SHIESE	24.21		
	THE REAL PROPERTY.		TO SERVICE	100000000000000000000000000000000000000		E SE		
Market barriers should be eliminated by uniform quality tandards and the increasing need for resources should	100	100	100	Nen	moderate			
se served by an extension of the usable feedstock	通響							
conomically valuable forests	moderate	low	moderate	low	alah .			
sarvesting and energetic utilization of non-woody slomass (e.g. reed, miscanthus, etc.)	moderate	motated	necessil	low	notatel			
troadleaved wood utilization efficiency increase fundamental research in breeding and agriculture for	Neh	Ngh	moderate	low	No			
nergy plants	low	low	low	low	-			
stablishment of short rotation plantation of fast rowing trees on agricultural land	not at all	low	notatell	low	moderate			
offorestation of abandoned land and other lands that s not in use for other purposes	Mah	Net	notetali	moderate	Ngh			
undamental research in breeding and agricultural echnology (plantation, harvesting, etc.)	not et all	low	notatell	low	moderate			
tesearch in conflicts between natural conservation and niomass production on both, woodland and agricultural	Mah	low	low	low	100			
and lesearch in CO <sub>2</sub> -storage and -emissions for different	Ngh	low	low	low	CARD.			
ypes of biomass Use of non-forest wood fuels, e.g. wood from tree					100000			
runing along roads or paths, from parks as well as rom agricultural sites (fruit trees)	moderate	low	low	low	Her			
ise of wood from removing trees from pasture land improve harvesting technology to provide additional	moderate	rotetel	not st ell	instatut	- Man			
assortments for energetic use (e.g. comcobs) lasic studies on material blends: e.g. logistics and	moderate	low	low	low	moderate			
torage; combustion characteristic, disposal of ash,	moderata	low	low	low	Net			
Deal with technical/ecological challenges		CAN HO			UEAS			
Deal with technical/ecological challenges Utilization of biomess ashes	Nah	low	not at oil	low	Net	1000		
lash utilization map for specific regions	160	low	notatali	moderate	Neh			
Decision support system (DSS) for ecologically efficient upply chains utilizing logging residues itudy of nutrient cycles for (i) forest biomass, (ii)	No.	low	moderate	low	-			
itudy of nutrient cycles for (i) forest blomass, (ii) energy plants, and (iii) secondary feedstock	Net	low	low	moderate	moderate			
Cooperation								
cooperation between forest owners for market levelopment	Ngh	moderate	Nah	moderate	moderate			
cooperation between different actors within the forest uel supply chain	Non	moderate	moderate	moderate	moderate			
cooperation between material and energetic use via pint procurement reducing procurement costs and	Mah	low	moderate	low	1			
ncreasing supply security for both uses				E REAL PROPERTY.				
evelopment of usage concepts, operators and ousiness models for diverse supply chains	Non	low	low	low	moderate			
evelopment of supply concepts for industrial applications, especially with regard to security of	Ngh	low	low	low	moderate			
			EBAS		2001			
upply and risk management Development of recognized and practicable methods								
upply and risk management: bevelopment of recognized and practicable methods or the preparation of LCAs for the entire biomass upply chain	No	moderate	moderate	moderate	No.			

Graph 2: Fire wood as priority SCORP

#### **Pellets**

#### Results per SCORP

- All partners showed considerable interest in stimulating the use of national competencies to introduce and expand networks and to increase the use of ICT within all processes in order to improve process and customer orientation.
- Similarly, all partners showed considerable interest in the reduction of the energy
  input in processing biomass in order to reduce the energy input in the supply chain.
- Little interest was expressed regarding the improvement of storage properties of biomass fuels at the consumer as well as for new drying technologies of forest fuels along with torrefaction to improve material's characteristics.
- Regarding the improvement of fuel logistic concepts, the increase of the use of railways and the use of inland water ways for forest fuel transport are of low or no interest as well as the optimization of the location and the capacity of comminution.
- Similarly, harvesting and energetic utilization of non-woody biomass, fundamental research in breeding and agriculture for energy plants/agricultural technology as well as establishment of short rotation plantations of fast growing trees on agriculture land was also identified as of low interest.
- Use of wood from removing trees and improvement of harvesting technologies to provide additional assortments for energetic use are also of low interest.

AUGUS TO THE STATE OF THE STATE	Styria Third	Romania	Serbie Second	Slovenia	Western Macedonia Second	Slovekie
Indicate the priority	priority	priority	priority	priority	priority	priority
Select the chosen SCORPs of your region  Indicate the priority of the actions from the drop down	Polists	Policis	Polists	Polieta	Pallets	Polists
list below as "high", "moderate", "low" or "not at ail".	-	Mark Salah	Sventage		Seations	THE REAL PROPERTY.
Introduce new and expend existing innovation networks Promote International R&D collaboration	moderate	No	low	Net	100	moderate
Stimulate use of national competencies Enhance adaption and implementation of best	moderate	Net	Met	100	Han	Non
practices in the forest fuel supply chain	low	Man	Men	moderate	140	moderate
Improve process and customer orientation	•					
Use of online tools for selling forest fuel assortments (online information/ordering platform for biomass, Biomass Trading Geo Portal)	moderate	100	moderate	low	moderate	low
Increase the use of ICT within all processes	moderate	Net	moderate	moderate	Net	-
Automatic round wood takeover at biomass trade centres	not at all	retotal	moderate	notatell	not at all	moderate
Enabling the possibility for customers to pick up biomass outside the opening hours of biomass trade	low	retetal	not at off	low	low	low
centres or similar retailers Introduce trademerks	low	low	No	No	*	low
Interest in biomass trade centres*	low	moderate	Net	No	low	No
Reduce the energy input in the supply che Reduction of energy input in processing biomass (e.g.	in					
chipping) Increase tool life and extend periodicity of	Ngh.	100	moderate	Name of the last	moderate	Net
maintenance to reduce overall energy input over the life time	Nah	moderate	low	moderate	moderate	low
Apply economic methods to determine optimal processing with reduced energy input Reduction of energy consumption in forest fuel	moderate	100	low	No	Net	No
logistics	moderate	No	low	low	moderate	Hen
Store biofuels Improving storage properties of biomass fuels at	low		low		moderate	low
producer/trader Improving storage properties of biomass fuels at	moderate	low	low	low	low	low
consumer Increase the knowledge of long-term storage of		low	low	low	moderate	low
biomass Study self-ignition of stored materials	moderate	low	moderate	noteral	moderate	low
Improve meterial characteristics					14	
Develop new methods for easily measuring quality characteristics	low	moderate	moderate	No	moderate	low
Drying of forest fuels 1.Technologies	low	moderate	low	moderate	moderate	low
2.Economic calculations	low	Not	low	moderate	moderate	moderate
3.Incorporation in efficient supply chain Torrefaction	low	moderate	not at all	moderate	low	low
Separation of undesired contaminations	low	Man	low	low	low	low
Improve forest fuel logistic concepts			303303	BD01802		
Increase the use of the railway for forest fuel transport	moderate	not at all	low	low	nututel	low
Use inland water way for forest fuel transport if possible	not stell	net at all	moderate	notatel	not at all	not at all
Seek for multimodal solution for forest fuel transport Increase the number and capability of biomass	No.	Man	low	moderate	moderate	noderate
terminals  Balance intermediate storage against the connected	Man	moderate	low	moderate	low	moderate
extra costs Optimize location and capacity of comminution	low	low	moderate	moderate	low	moderate
Develop methods to reduce empty drives  Develop new types of containers or adapt existing	Main	moderate	moderate	100	moderate	low
container types according to customer needs and feeds tock properties	low	moderate	low	moderate	moderate	Mah
increase the use of a system enabling delivery of wood chips (blow into storage) similar to pellets	not at all	notateli	retotali	notateli	esteral	low
Studying the interaction of different supply chains to each other	moderate	Hen	low	moderate	moderate	moderate
Expand the resource basis for bioenergy gener	etion					
Market barriers should be eliminated by uniform quality		COMME.			7.550	1102100
standards and the increasing need for resources should be served by an extension of the usable feedstock	low	100	Hen	Name of	Nah	moderate
	75-1					122
Energetic use of wood from slopes, meadows and less			District St.			
Energetic use of wood from slopes, meadows and less economically valuable forests  Harvesting and energetic utilization of non-woody	not at all	moderate	100	low	moderate	low
economically valuable forests  Harvesting and energetic utilization of non-woody biomass (e.g. reed, miscanthus, etc.)	not at all	moderate	Mah not et all	low	moderate	not at all
economically valuable forests Harvesting and energetic utilization of non-woody biomass (e.g. reed, miscanthus, etc.) Broadleaved wood utilization efficiency increase Fundamental research in breeding and agriculture for	not at all not at all not at all not at all	100000	not et all			320
economically valuable forests Harvesting and energetic utilization of non-woody biomass (e.g., reed, miscanthus, etc.) Broadleaved wood utilization efficiency increase Fundamental research in breeding and agriculture for energy plants.	potatell	moderate moderate	Nigh Nigh moderate	low low	moderate low moderate	low
economically valuable forests threated any end expect utilization of non-woody blomess (e.g., read, miscanthu, etc.). Broadleawed wood utilization efficiency increase trundamental research in breeding and agriculum for energy plants. Establishment of short rotation plantation of fest growing tree on agricultural land.	Hermaner Hermann Herman	moderate moderate		low low low	moderate low moderate low	low low
economically valuate forests traversing and emergine citization of non-ecody biomass (e.g. rend, miscanthus, etc.) foundational most citization efficiency increase incumental research in breeding and agriculture for emergy patern stateshimment of short rotation plantation of fast growing tree on agricultural land forestation of absorbed task and other sinch that in not in use for other purpose.	not stall not stall not stall low	moderate moderate low escates	moderate	low low low not still.	moderate low moderate low	low low low
economically valuable forests threatment and emergency children from ecody blomess (e.g. rend, miscanthus, etc.) foodleaved wood utilisation efficiency increase which was a second of the economic control of the energy plants of short notation plantation of fast growing tree on agricultural land threatment increase in the economic control of threatments increase in beneding and other lands that in not in use for other purposes functionally increased in a control of stack-indeed plantation, haveness, etc.)	Hermaner Hermann Herman	moderate moderate		low low low	moderate low moderate low moderate	low low
economically valuate fores to there strength ending of the monopoly biomass (e.g. rend, miscanhua, etc.) forestered wood utilisation efficiency increase incurate most received in the most parasition of fast growing tree on agricultural land thinsessation of absorbed last and other since the strength ending of the propose the propose	not stall not stall not stall low	moderate moderate low escates	moderate	low low low not still.	moderate low moderate low	low low low
economically valuable forests traversing and emergine citization of non-ecologistics (e.g. rend, miscanthus, etc.) increases and continued to the citization of the continued for traversing traversing to the citization of feat growing trees on agricultural land traversing trave	not stall not stall not stall low	moderate moderate low escates	moderate	low low low not still.	moderate low moderate low moderate	low low low
economically valuable forests startesting and emerged collection of non-ecologistic processing and emerged collections of non-ecologistic processing and emerged collections of non-ecologistic foresteroid processing and emerged parts (stability memory plants) (stability emerged parts) (stability emerged parts)	not stall not stall not stall low not stall	moderate moderate low escates	moderate moderate low	low low low low makes all. mot stall low	moderate low moderate low moderate moderate moderate	low low low
economically valuable forests startesting and emerged collation of non-ecologic pictures (e.g. rend, miscarchina, etc.) discretization entire in the collation entire increase fundamental research in breading and agriculture for energy plane. Establishment of short restorin planeation of fast growing tests on gentlement and other lands. Data for the collection of the collation of the planeation of the collection of the collection of discretization of abandoned land and other lands. Data forest the collection of the collection of the collection of the collection collection of th	pot ot all nex scall low not at all low moderate	moderate moderate low mix et al.	moderate noderate noderate	low low low low makes all. mot stall low	moderate low moderate low moderate moderate moderate	low low low low low low
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economically valuable forests stressing and emergine citization of non-accept pictures are considerated and considerated pictures are considerated and considerated foresteaded and considerated endicated pictures for energy plans. Establishment of short nation plansation of fast growing treas on patientural and Afforestation of abandoned land and other lands that in one has been proposes. Furnamental research in breeding and agricultural enterprises and proposes. Furnamental research in breeding and agricultural enterprises and proposes. Furnamental research in breeding and agricultural and the control of the propose furnamental proposes. Furnamental research in breeding and agricultural and the of non-forest wood fasts, ag wood from twe from agricultural sites (but twee). In the of wood from any the of wood from research to de wood from the propose the propose th	pot at all pot at all low not at all low moderate as all pot at al	moderate low moderate low moderate moderate moderate	moderate low moderate moderate	low low low low motion at all low moderate	moderate low moderate low moderate moderate low low low moderate low	low
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economically valuable forests  stressing and emerged cities from of non-ecological  processing and emerged cities from of non-ecological  processing and emerged cities and experiments  from the cities of the cities of the cities of the  from the cities of the cities of the cities of  from the cities of the cities of  from the cities  from the cities of  from  from the cities  from the cities  from the cities  from the  fro	pot at all pet at all low moderate as all low	moderate noderate low not stall low not stall low not stall low noderate moderate moderate moderate	moderate low moderate moderate moderate low low low low	low low moderate mode	moderate fow  May  moderate fow  May  moderate fow  May  moderate fow  May  moderate fow  moderate fow  fow  moderate fow  fow  moderate fow  fow  moderate fow	tow
economically valuable forests  startwesting and emerged citization of non-ecological  processing and emerged citization of non-ecological  processing and emerged citization efficiency increase  fundamental reases his breading and agriculture for  mergy plants.  Statistic inventor of short rotation plantation of fast  growing treases on pacticular land  Afforestation of abandoned land and other land; that  in not runs for other purposes.  Fundamental reases his breading and agricultural  extractionary plantation, have stopped  search in conflicts between natural consension and  emerged  search conflicts between natural consension and  emerged  search conflicts between natural consension and  emerged  search conflicts between natural consensions  and  and  search conflicts between natural consensions for  different  conflicts and  emerged  search conflicts between natural consensions  and  and  search  and  search  and  search  se	pot at all pet at all	moderate noderate low not stall low not stall low not stall low noderate moderate moderate moderate	moderate low moderate moderate low low low low	low low low low met staff lost staff low moderate low moderate low	moderate low moderate low moderate low moderate low moderate low moderate low moderate	Ion
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economically valuable forests  strained and enterest valuable for each  minimum reach his breading and agriculture for  mercy grains.  Stability and a stability of  minimum reach his breading and agriculture for  mercy grains.  Stability and or stability and  minimum reach his breading and agriculture for  mercy grains.  Stability and or stability and  minimum reach his breading and agricultural  minimum reach  minimum reach his breading and agricultural  minimum reach  minimum rea	pot at all pet at all low moderate as all low	moderate noderate low not exall low moderate moderate moderate moderate	moderate low moderate moderate low low low low moderate	low low self. Self-resident se	moderate low moderate	low
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Graph 3: Wood Pellets as priority SCORP

#### Wood chips (premium and slash)

Results per SCORP

- All partners expressed interest in enhancing the adaption and implementation of best practices in the forest fuel supply chain as well as the increase of the use of ICT within all processes.
- Enabling the possibility for customers to pick up biomass outside the regular opening hours was of low interest.
- Some interest was shown regarding the development of new methods for easily measuring quality characteristics as well as for drying of forest fuels (technologies, economic calculations and incorporation in efficient supply chains).
- Torrefaction was not considered as a priority in this SCORP.
- Railways and water ways were also not considered as options to improve forest fuel logistic concepts.
- On the contrary, all regions consider as of high importance to eliminate the market barriers in order to expand the resource basis for bioenergy generation.
- Likewise, **utilization of biomass ashes** was also of high importance to the regions regarding the technical/ecological challenges.
- Cooperation between forest owners for market development, cooperation between different actors within the forest fuel supply chain, development of supply concepts for industrial applications and improving standardization were also identified as of considerable interest.

Aol sA1:W72pecific checklists derived from								
Select the region (from drop-down list)		yria	Romania	Serbis	Slovenia	Slovekia		h Tyrol
Indicate the priority	First priority	Second priority	Third priority	Third priority	Third priority	First priority	First priority	Second priority
Select the chosen SCORPs of your region	Prendun	Wood chips from slesh	Woodchips	Wood chips	Wood chips	Wood chips	Premium wood chips	Wood o
Indicate the priority of the actions from the drop down								
list below as "high", "moderate", "low" or "not at all".						discussion of the latest states and the latest states are the latest states and the latest states are the late		
Introduce new and expand existing innovation		MINISTERNO .			BEE			
Promote international R&D collaboration Stimulate use of national competencies	moderate moderate	moderate	No	No.	Mah	No	low	low
Enhance adaption and implementation of best practices in the forest fuel supply chain	moderate		Mah	100	10	100		He
Improve process and customer original	intation	Colonia						
Use of online tools for selling forest fuel assortments (online information/ordering platform for biomass,	ligh	reat out off	Nati	moderate	No.	-	not at all	NO. OF
Biomass Trading Geo Portal) Increase the use of ICT within all processes			A TOTAL	moderate			moderate	modern
Automatic round wood takeover at biomass trade	No	exten	met at all	moderate	moderate	moderate	not at all	not et
centres Enabling the possibility for customers to pick up			-	max and mile			out at all	ner m
biomass outside the opening hours of biomass trade centres or similar retailers	IOM		1.5	Distant.	IOW	-04		
Introduce trademarks Interest in biomass trade centres*	low	low	roderate	moderate	Nah	Nan	rest or all	med at
Reduce the energy input in the sup	ply chain							
Reduction of energy input in processing biomass (e.g. chipping)	Mari	Nagh		moderate	moderate	-	retatali	metat
increase tool life and extend periodicity of maintenance to reduce overall energy input over the	Meth		moderate	law	moderate		No se also	met at
life time Apply economic methods to determine optimal	moderate	Water II		low				
processing with reduced energy input Reduction of energy consumption in forest fuel	moderate			low	moderate	TO SHOW THE	-	
oristics	and the same of	E STATE	ELINES.		-		Name of	A SECOND
Store biofuels Improving storage properties of biomass fuels at producer/trader	moderate		low	moderate	moderate	100	moderate	modera
producer/trader Improving storage properties of biomass fuels at consumer	moderate	No.	low	low	low	Neh	les.	No.
increase the knowledge of long-term storage of	No.	len i	low	low	Math	100	low	low
biomass Study self-ignition of stored materials	Nah	Nah	low	not at all	moderate	NA	low	low
Improve meterial characterist	ics	1 170						1.570
Develop new methods for easily measuring quality characteristics	moderate	100	moderate	moderate	high	No.	100	Negl
Drying of forest fuels 1.Technologies	moderate	Nach .	moderate	moderate	No.	Nah.	Mark Mark	No.
2.Economic calculations	moderate	Mah	high	moderate	No.	Mah	Mah	10
3.Incorporation in efficient supply chain Tomefaction	ret et al.	and all all	moderate	moderate not at all	moderate low	moderate	Date and	100
Separation of undesired contaminations	moderate	Mah	No.	moderate	low	- hah	hagh	100
Improve forest fuel legistic conc	epts					ELECTION AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON		
increase the use of the railway for forest fuel transport	low	met at an	not at all	low	moderate	moderate	retoral	-
Use inland water way for forest fuel transport if possible	100 000	no state	ectoral	moderate	-	nstatel	mental	THE RE
Seek for multimodal solution for forest fuel transport increase the number and capability of biomass	ligh.	moderate	100	low	moderate	moderate	met at all	most oil
terminals  Balance intermediate storage against the connected	Mgh	moderate		moderate	Tesh	Ref.	makel	200
extra costs	Net	-	moderate	moderate	Nation 1	moderate	not at all	net at
Optimize location and capacity of comminution Develop methods to reduce empty drives	moderate		moderate	moderate	moderate moderate	Man.	PRODUCT OF	me of
Develop new types of containers or adapt existing container types according to customer needs and	No.		moderate	low	moderate	140	moderate	modera
feedstock properties increase the use of a system enabling delivery of wood	10000	low		-		low	low	low
chips (blow into storage) similar to pellets Studying the interaction of different supply chains to	Service Co.	NOW.		low	moderate	moderate	low	low
each other				TON .	moderate	moderate	Name and Address	ION
Expend the resource basis for bloenerg	generation							
Market barriers should be eliminated by uniform quality				等其				
standards and the increasing need for resources should be served by an extension of the usable feedstock							A W	lo de
Energetic use of wood from slopes, meadows and less economically valuable forests	moderate	-	moderate	100	moderate	No.	low	low
Harvesting and energetic utilization of non-woody biomass (e.g. reed, miscanthus, etc.)	nat at all	low	moderate	not six of	low	not bt of	100	100
Broadleaved wood utilization efficiency increase	low	low	moderate	legh	low	Nah	low	low
Fundamental research in breeding and agriculture for energy plants	low	low	moderate	moderate	low	Nah.	mot sit of	not at
Establishment of short rotation plantation of fast growing trees on agricultural land	low	low		moderate	low	100	most att all	most act
Afforestation of abandoned land and other lands that is not in use for other purposes	low	low	Mari	-	metal	Age	met at all	not at
Fundamental research in breeding and agricultural technology (plantation, harvesting, etc.)	low	moderate	No.	moderate	low	moderate	not at all	not et
recrinology (prantation, narvesting, etc.) Research in conflicts between natural conservation and biomass production on both, woodland and agricultural	low			low	law		not at all	net st
and  Research in CO <sub>2</sub> -storage and -emissions for different				NO BE		VIEW C		
types of biomass Use of non-forest wood fuels, e.g. wood from tree	moderate	moderate	high	rroderate	moderate		not at all	moz et
Use of non-forest wood fuels, e.g. wood from tree pruning along roads or paths, from parks as well as from agricultural sites (fruit trees)	moderate	100	moderate	moderate	140	-	low	low
Use of wood from removing trees from pasture land	moderate	No.	moderate	not at all	moderate	Nation 1	low	low
improve harvesting technology to provide additional assortments for energetic use (e.g. comcobs)	res at all	low	moderate	low	No.	-	low	low
Basic studies on material blends: e.g. logistics and storage; combustion characteristic, disposal of ash, emissions	moderate	-	100	low	moderate		160	-
是是在"是"中区域。是1865年中的1965年	Name of the last o		(SU(SI)	STATE OF				
Deal with technical/ecological cha Utilization of biomass ashes	langes Mgh	No.	-	moderate	No.		No.	No.
Slash utilization map for specific regions Decision support system (DSS) for ecologically efficient	must as all	No.	hall	moderate	160	100	Na.	Na
Decision support system (DSS) for ecologically efficient supply chains utilizing logging residues Study of nutrient cycles for (i) forest biomass, (ii)	PR. Call	ligh	lage.	law	moderate	-		No.
study of nutrient cycles for (i) forest biomass, (ii) energy plants, and (iii) secondary feedstock	moderate		No.	moderate	moderate		ner st of	Sex at
Cooperation			28.53	VENEZI	100		and miles	
Cooperation between forest owners for market development	100	100	No	moderate	-	-	, No.	1
Cooperation between different actors within the forest fuel supply chain	Nat		100	moderate	moderate	No	Hah	1
Cooperation between material and energetic use via	Non	140	Nigh	low	moderate	-	100	140
oint procurement reducing procurement costs and		STATE OF THE PARTY	S. Siki	8 82 48	moderate	NEW WAR	No. of Lot	
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ncreasing supply security for both uses Development of usage concepts, operators and business models for diverse supply chains Development of supply concepts for industrial applications, especially with regard to security of	moderate	*	9	moderate	9	2	100	*
ncreasing supply security for both uses  beginners of usage concepts, operators and business models for otherse supply chains  bewelopment of supply concepts for industrial applications, especially with regard to security of  upply and risk management  Development of risk monagement and practicable methods	*	9 9	9	moderate	•	9	100	*
ncreasing supply security for both uses Development of usage concepts, operators and business models for diverse supply chains	TO BE STORY	moderate	2 2		1000	3 3 3	low	low

Graph 4: Wood chips as priority SCORP

## 3 Annex I

## Compilation of regional checklists

# GIS K E 683



COBISS ©

And specific checklists derived from the improvement of the defined	biomass SCORPs																				
Select the region (from drop-down list	-	Styria			Romania			Serbia			Slovenia		w	estern Maced	ionia		Slovakia			South Tyrol	
Indicate the priority		Second priority	Third priority	First priority	Second priority	Third priority	First priority	Second priority	Third priority	First priority	Second priority	Third priority	First priority	Second	Third priority	First priority	Second priority	Third priority	First priority	Second priority	
Select the chosen SCORPs of your region	Premium wood chips	Wood chips from blash	Wood Palets	Hrs wood	Poliets	Woodchips	fire wood	Poliets	Wood chips	Hre wood	Pallette	Wood chips	Fire wood	Pellets	E1973	chips	fire wood	polists	Wood chips	Wood chips from slesh	
dicate the priority of the actions from the drop down	THE REAL PROPERTY.	3300	FIGURE 1	(BEIL)									N. Kat			high	moderate				
t below as "high", "moderate", "low" or "not at all".	NAME OF STREET						80000									0.00					
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e of online tools for selling forest fuel assortments	30254			No.		30.00	OTHER DESIGNATION OF THE PERSON OF THE PERSO			MAN TO SERVICE STATE OF THE PARTY OF THE PAR			-		-			la con		U.S.	
nline information/ordering platform for biomass, omass Trading Geo Portal)	-	not state	moderate		-	100	-	moderate	moderate	Net	low	-	rnoderate	moderate		-	low	low	not stud	not stad	
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ntres or similar retailers troduce trademarks	-	low								moderate		NOW.		NOW .				1000			
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cessing with reduced energy input duction of energy consumption in forest fuel gistics	-	-	moderate	-	-	100	low	low	low	low	low	moderate	low	moderate		-	-	-	102 10 102	and at all	
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proving storage properties of biomass fuels at nsumer	moderate	100	moderate	low	low	low	low	low	low	low	low	low	low	low		200	moderate	low	No.	100	
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evelop new methods for easily measuring quality aracteristics	moderate	100	low	moderate	moderate	moderate	low	moderate	moderate	low	-		low	moderate		-	moderate	low	Commercial	-	
ying of forest fuels											NAME OF STREET	A STREET, STREET,					No.	low	100	160	
Technologies  conomic calculations	moderate	1	low	moderate	moderate	moderate	No.	low	moderate moderate	morter of	moderate	Mah	low	moderate		No.	moderate	low	Nah	100	
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prefaction peration of undesired contaminations	moderate	mak set adj	low		moderate	moderate	mak set all	not at all	not at mit	not at all	and at all	low	Total at all	low		moderate	low	low	minal	med and self	
	10 W. S.		AND DESCRIPTION OF THE PERSON		NA .			low	moderate	low	low	low	low	low	Second Co.		moderate	low		100	
Improve forest fuel logis rease the use of the railway for forest fuel transport		-	moderate		NEW COLUMN		low	low	DINEUR.		Contract of the last			No.	HI DOWN	WAST.					
e inland water way for forest fuel transport if	-	- The second	THE REAL PROPERTY.	market (		med at tall	moderate	moderate	roderate	Control of the Contro	not at all	moderate	1000	ne e e		moderate	moderate not ut all	Marie Control	Man	mak at all	
ssible ek for multimodel solution for forest fuel transport	Name of	moderate			TO NAME OF		low	low	low	low	moderate	moderate	low	moderate		moderate	Albanda (Albanda)			and the second	
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evelop methods to reduce empty drives		-	-	moderate	moderate	moderate	not at all	moderate	moderate	moderate	-	rnoderate	moderate	moderate		140	moderate	low	max or oil	not stall	
rvelop new types of containers or adapt existing intainer types according to customer needs and	-	-	low	low	moderate	moderate	notated	low	low	low	moderate	moderate	low	moderate		1	100	100	moderate	moderate	
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ervesting and energetic utilization of non-woody omass (e.g. reed, miscanthus, etc.)	not at all	low	rest us all	moderate	moderate	moderate	not as all	not stall	net at all	100 100 100	low	low	low	moderate		me et all	wested	not ot all	100	100	
oedleaved wood utilization efficiency increase	low	low	net at ell	NA I	moderate	moderate	146	Nach		moderate	low	low	low	low		No	-	yow .	low	low	
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