



Evaluation of nonrenewable lignite resources by means of sustainability indicators

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NONRENEWABLES

- LIGNITE IS – BY DEFINITION – A NONRENEWABLE RESOURCE.
- SUCH DEFINITION ONLY SUGGESTS THAT WE DON'T EXPECT MANKIND TO EXIST LONG ENOUGH TO EXPERIENCE ORIGINATION OF NEW COAL DEPOSITS.
- But ...

... BUT, IT ONLY TAKES A FEW
MILION YEARS AND
A LITTLE BIT OF TECTONICS,
TOGETHER WITH
SOME SEVERE
CLIMATE CHANGE

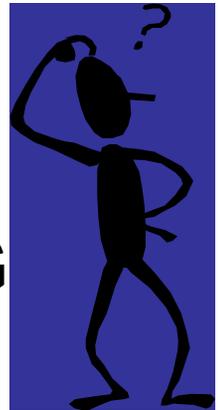


SENSE OF FUTURE

SDIMI
2007

NONRENEWABLES

- SUCH CONDITIONS TOOK PLACE IN THE PAST AND THERE IS NO REASON WHY NOT TO BE EXPECTED AGAIN.
- LET'S JUST WAIT AND SEE!
- AND MEANWHILE LET'S TRY TO MAKE LIVING ON EARTH MORE ACCEPTABLE.
- (TAKING INTO ACCOUNT THE FACT THAT CHANGES WILL HAPPEN sooner or later WHETHER WE DO ANYTHING OR NOT).



NONRENEWABLES

- Just to avoid misunderstandings:
- We must stop or at least limit all kinds of pollution
- We shall act environment friendly
- We have to expand sustainable awareness
- But we shouldn't go too far either
- Because ...



**MOTHER EARTH HAS SUFFERED
MANY CHANGES, (INCLUDING
MANY CLIMATE CHANGES)
THROUGH PAST HUNDREDS OF
MILIONS OF YEARS AND ALL
THOSE CHANGES OCCURRED
WITHOUT ANY REASONS ALIKE
THOSE THAT ARE BLAMED TODAY!**

NONRENEWABLES

Valley – pull-apart basin;
Complete Pliocene sedimentary sequence,
Including coal seam;
Average thickness 60 m (max. 168);
Coal mine: underground production; (4Mt/y)

NONRENEWABLES

underground 500 Mt left over

... if this is not enough ...

intact coal seam
200 Mt

Past and near future:

Minus 300 Mt

Šoštanj

Velenje



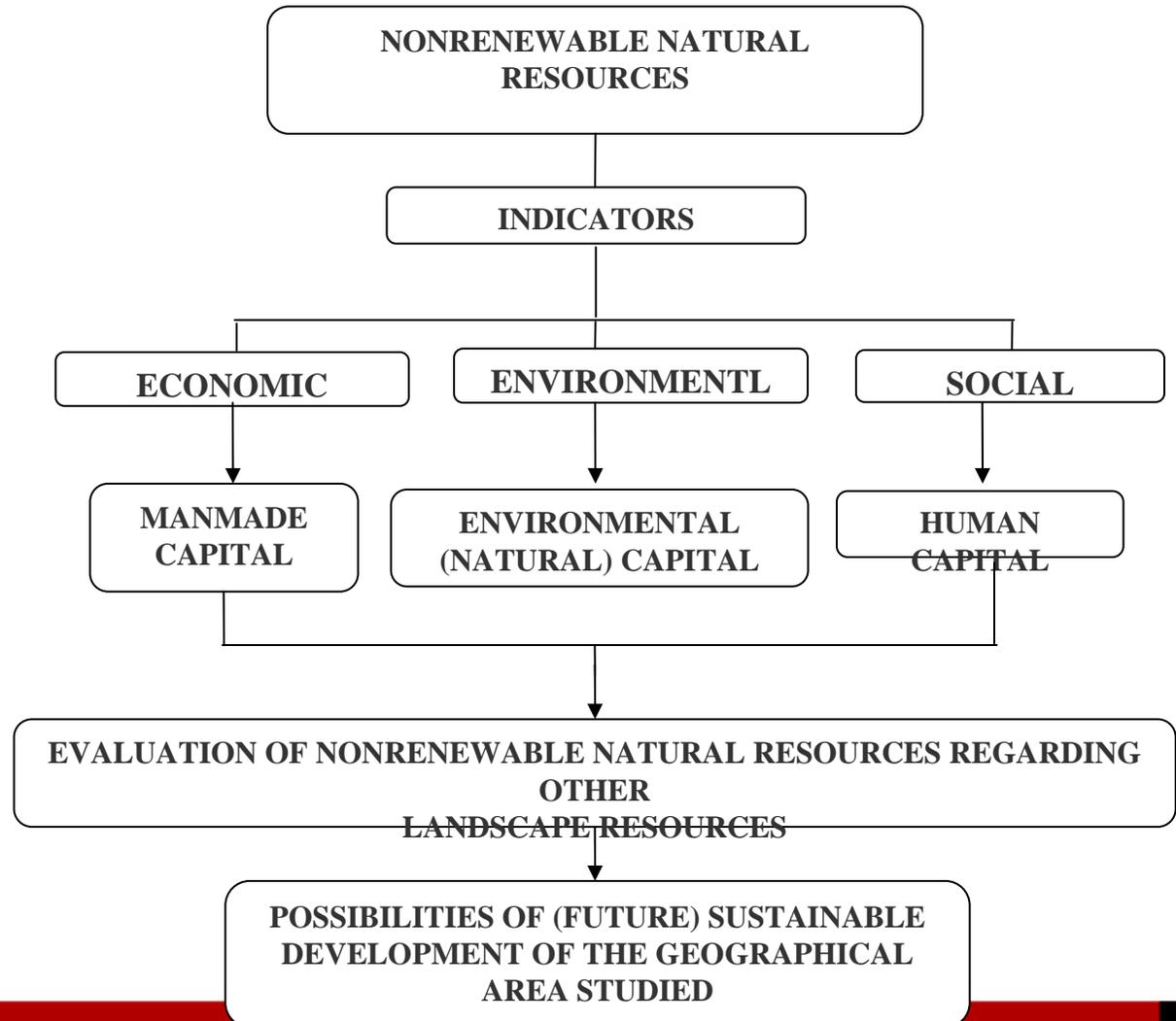
Indicators are taken as
substitutes for real conditions
performance

INDICATORS

Show
Me
The
Way
To
The
Next
...
future



SUSTAINABLE EVALUATION MODEL

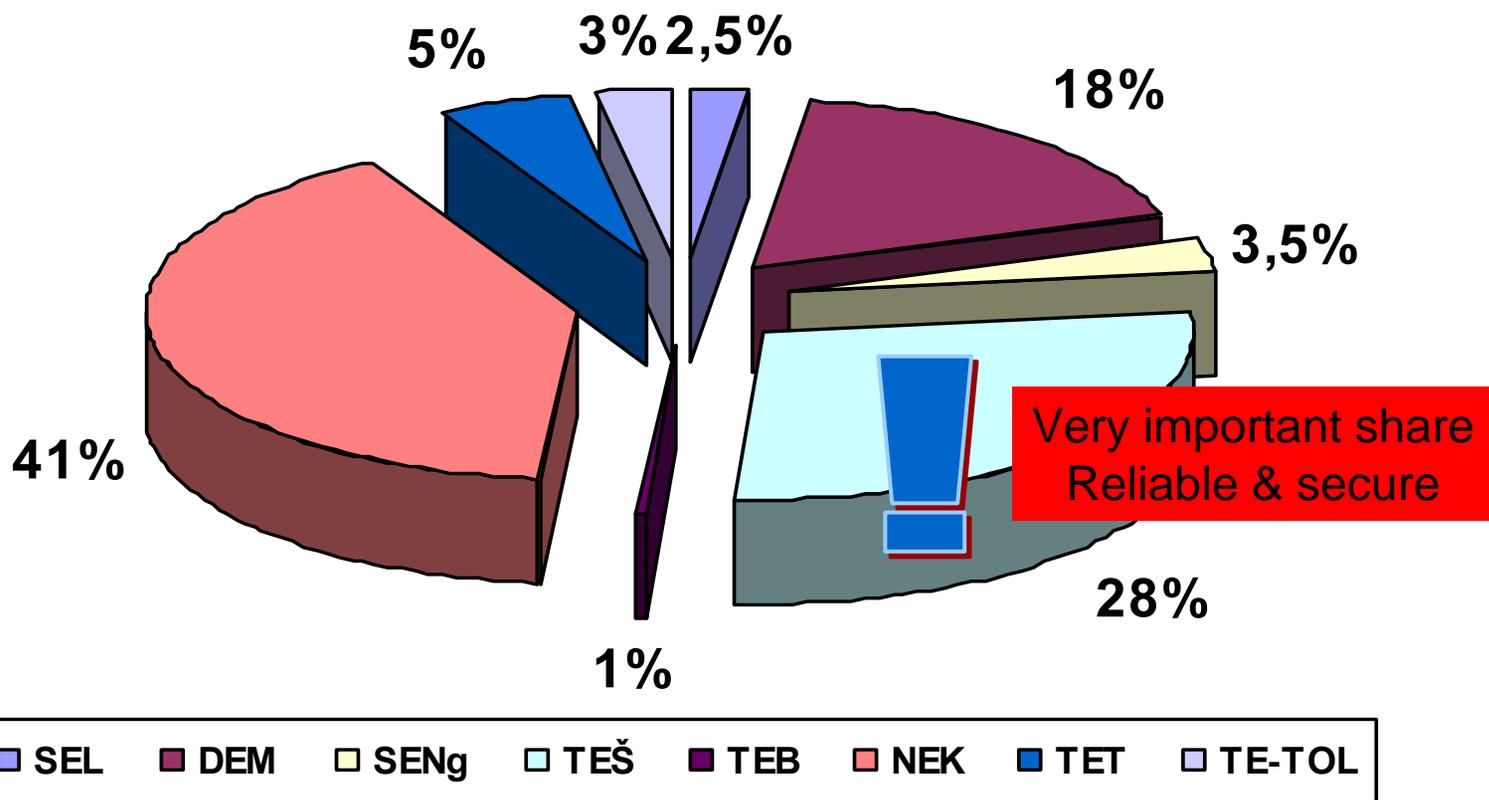




<i>ECONOMIC indicators</i>	<i>ENVIRONMENTAL indicators</i>	<i>SOCIAL indicators</i>	
<p><i>The lifespan of the ensured energy stock and the annual electricity production</i></p>	<p><i>Indicators of nonrenewable resources at the area researched</i></p>	<p><i>Change of number of population</i></p>	
	<p><i>Indicators of renewable resources at the area researched</i></p>		
	<p><i>Other (indirect) environmental indicators of environmental resources state at the area researched:</i></p> <ul style="list-style-type: none"> • Quality of surface water resources • Indicators of soil pollution • Indicators of renewable (current) natural resources 		<p><i>Population density (inhab./km²)</i></p>
<p>Share of employees in service industries</p>		<p><i>Share of population in urban areas</i></p>	
<p>Rate of unemployed</p>			
<p>SENSE OF FUTURE</p>		<p>Selection criteria:</p> <ul style="list-style-type: none"> - availability of data - Purpose of evaluation - Importance for confrontation - Sort of human activities <p style="text-align: right;">SDIMI 2007</p>	

ECONOMIC INDICATOR example

The shares of the produced electricity of the HSE Group in 2002



ENVIRONMENTAL INDICATOR example



Air pollution

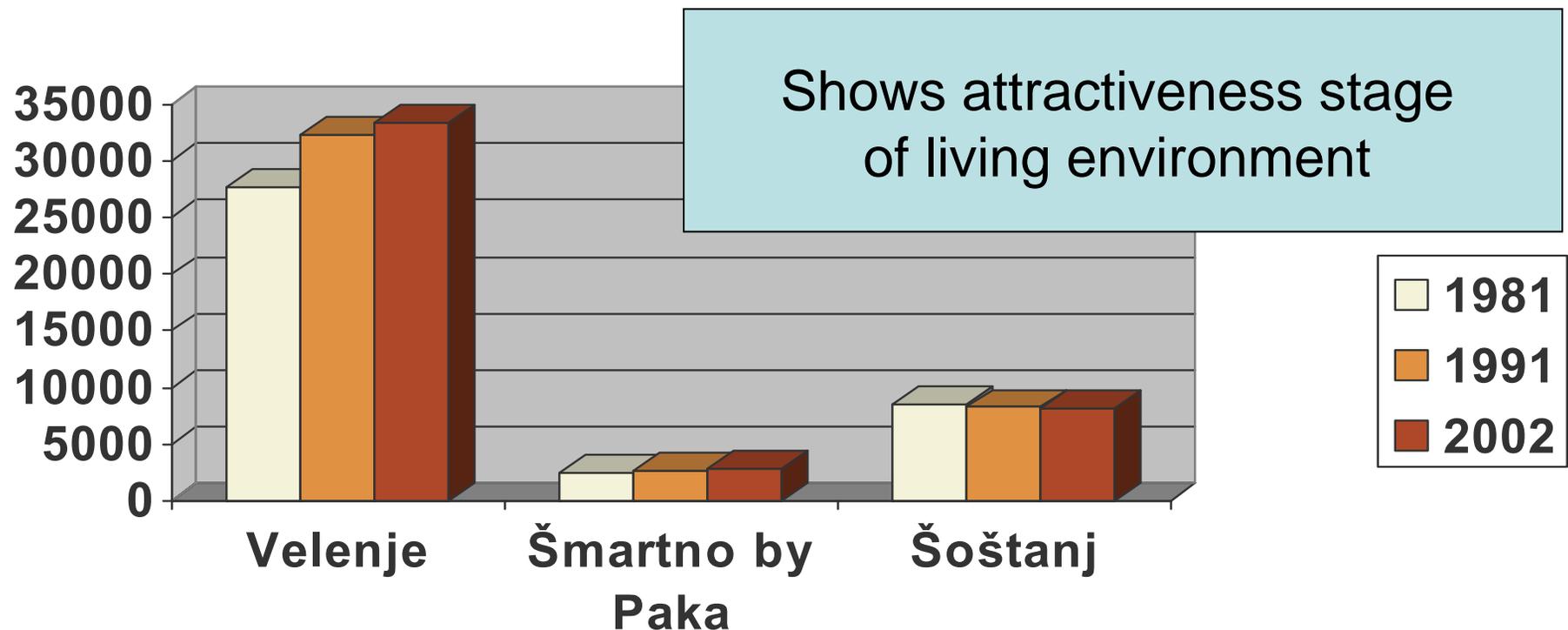


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SOCIAL INDICATOR example

Change of number of population in the period
1981-2002



EVALUATION

based on indicators



LANDSCAPE RESOURCE	PRESENT STATE - marks
NONRENEWABLE NATURAL RESOURCE	<i>3 - pretty available</i>
RENEWABLE NATURAL RESOURCES (WATER ...)	<i>4 - very available</i>
INHABITANTS	<i>4 - very available</i>
SETTLEMENTS	<i>2 - partly devaluated</i>
AGRICULTURAL LAND	<i>1 - heavy degradation</i>
PRODUCTION	<i>4 - very available</i>
TOURISTIC-RECREAT.	<i>4 - very available</i>
INFRASTRUCTURAL	<i>3 - pretty available</i>

AND
BASED
ON
THIS

SENSE OF FUTURE

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PREDICTION for SUSTAINABLE FUTURE

LANDSCAPE RESOURCE	POSSIBILITIES OF SUSTAINABLE USE
NONRENEWABLE NATURAL RESOURCE	<i>3 - some chances</i>
RENEWABLE NATURAL RESOURCE (WATER ...)	<i>4 - many chances</i>
INHABITANTS	<i>4 - many chances</i>
SETTLEMENTS	<i>3 - some chances</i>
AGRICULTURAL LAND	<i>2 - needs help before further interventions</i>
PRODUCTION	<i>3 - some chances</i>
TOURISTIC-RECREAT.	<i>4 - many chances</i>
INFRASTRUCTURAL	<i>3 - some chances</i>



**CONCLUSION:
COAL USE WILL (VERY LIKELY) CONTINUE
IN NEAR FUTURE until 2040.**

**WE ASSUME:
CLEAN COAL TECHNOLOGIES AND
UNDERGROUND COAL GASIFICATION
ARE FEASIBLE, AND CONSIDERED TO BE
SUSTAINABLE ENOUGH FOR THE NEXT
FUTURE.**

JUST TO THINK OVER



Our goal is development,
although sustainable,
but still development –
- at any price.



**Are we honest enough
to admit
that the sustainable development
is meant for mankind
and not for nature?**





**PLEASE FIND ADDITIONAL
INFORMATION IN THE PAPER
AND/OR VIA E-MAIL.**

THANK YOU!