On Spatially and Dynamically Optimal Forestry Development in Eurasia

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FORESTS OF EURASIA - PODMOSKOVNY VECHERA,
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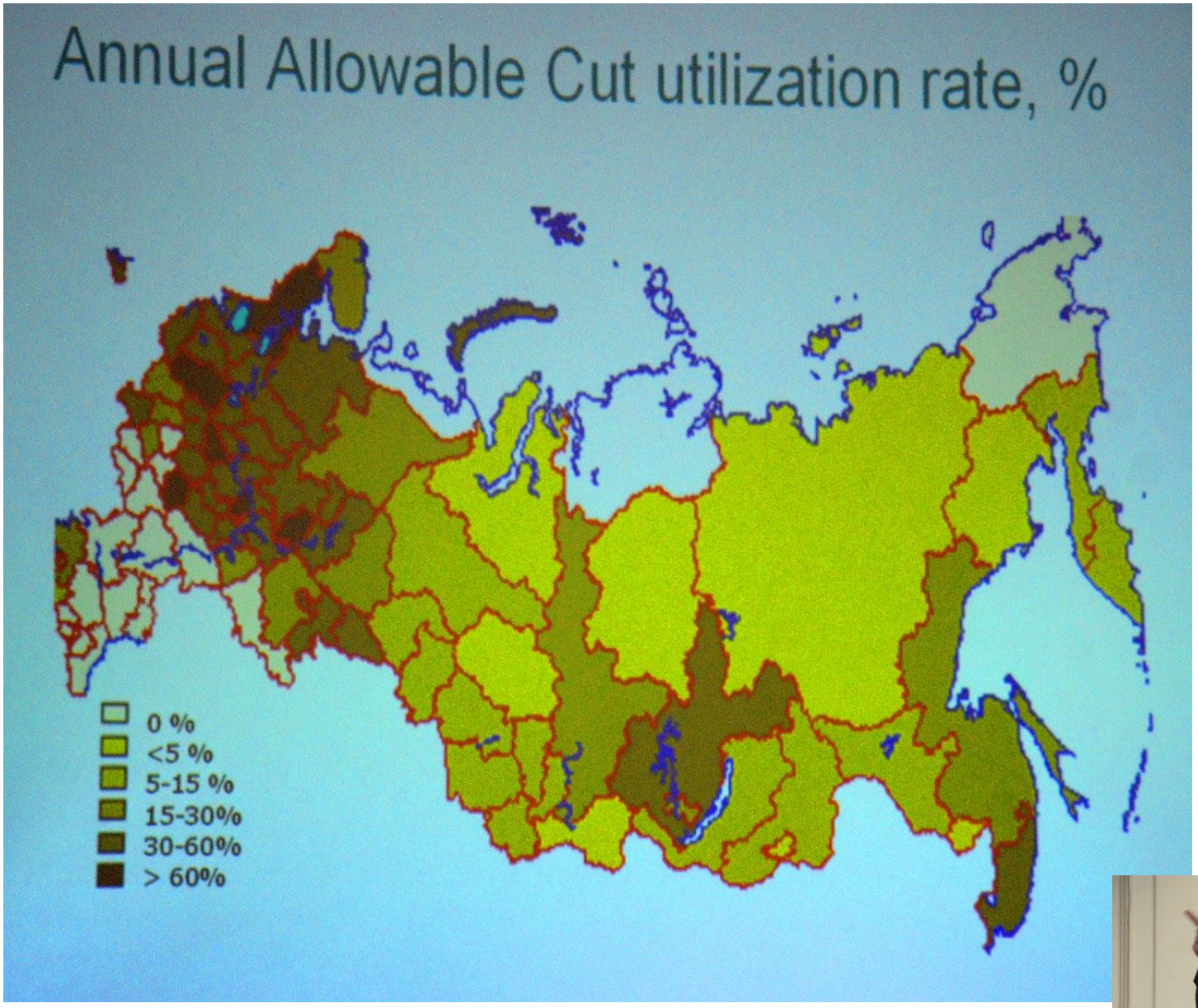
- **Forestry in Eurasia is of great importance.**

- **In several parts of Eurasia, in particular in Russian Federation, the maximum sustainable harvest level is much higher than the present harvest level.**

What do they say about this in Saint Petersburg?


ЛЕСОТЕХНИЧЕСКАЯ АКАДЕМИЯ



The utilization rate is very low.

Forest production is necessary for several industrial sectors,

a strong motivation for regional infrastructure development,

and necessary for large parts of the international trade.

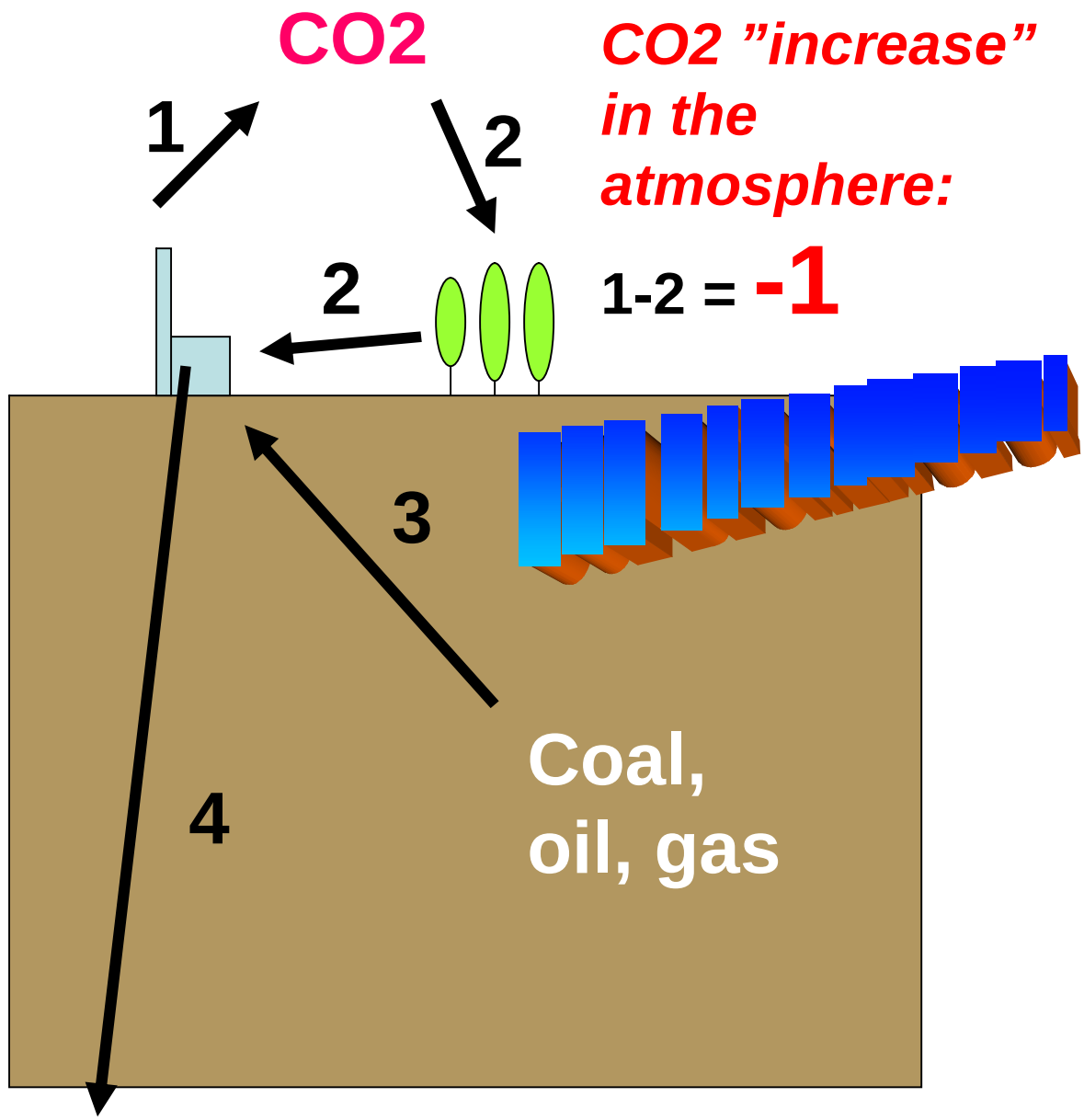
- **Forestry is fundamental to sustainable energy systems in Eurasia and neighbour regions.**

Rational forest management is a unique way to:

- ***fight global warming***
- ***and a source to economic development.***

We can solve the global warming problem!

Let us use CCS with 80% efficiency and use the forest with increased harvesting and high intensity silviculture!



- A great challenge is to develop these interdependent ways to use the forests in a way that is rational at a global level.

- **The analysis covers the general forest management problem in Eurasia.**

- **The problem is defined as an optimization problem and includes the following aspects:**

- **Forest management methods (continuous cover, rotation forestry), intensity, technology, forest product mix and global warming effects.**

- **The properties of the optimal solutions are determined with comparative statics analysis.**

Eurasia covers a very large territory.

Conditions of fundamental importance to optimal forest management are very different in different places within this territory.

Many things differ over space:

- ***Site productivity,***
- ***distances to sawmills, pulp mills, distances to pellet factories and forest fuel power plants,***
- ***distances to towns and cities that can utilize hot water in district heating nets,***
- ***numbers of forest recreation interested individuals in the neighbourhood,***

Many things differ over space:

Site productivity, distances to sawmills, pulp mills, distances to pellet factories and forest fuel power plants, distances to towns and cities that can utilize hot water in district heating nets, numbers of forest recreation interested individuals in the neighbourhood,

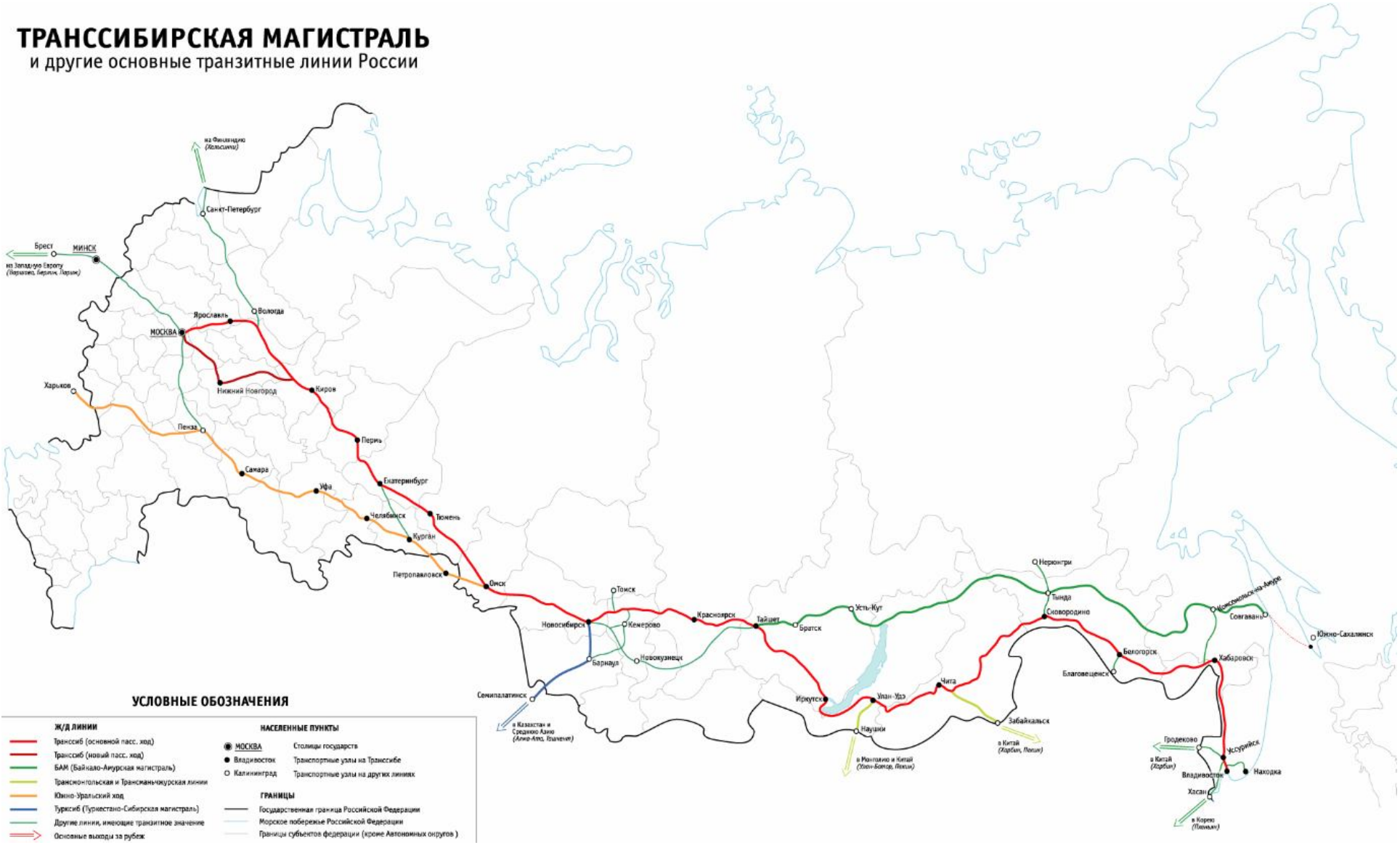
Availability of forest roads,

railroads and potential forest workers etc., differ

strongly over space.

ТРАНССИБИРСКАЯ МАГИСТРАЛЬ

и другие основные транзитные линии России



УСЛОВНЫЕ ОБОЗНАЧЕНИЯ

Ж/Д ЛИНИИ

- Транссиб (основной пасс. ход)
- Транссиб (новый пасс. ход)
- БАМ (Байкало-Амурская магистраль)
- Трансмонгольская и Транссаньчжурская линии
- Южно-Уральский ход
- Турксиб (Туркестано-Сибирская магистраль)
- Другие линии, имеющие транзитное значение
- Основные выходы за рубеж

НАСЕЛЕННЫЕ ПУНКТЫ

- МОСКВА — Столицы государств
- Владивосток — Транспортные узлы на Транссибе
- Калининград — Транспортные узлы на других линиях

ГРАНИЦЫ

- Государственная граница Российской Федерации
- Морское побережье Российской Федерации
- Границы субъектов федерации (кроме Автономных округов)

$$\max_{u(\tau,x(\tau))} \int_{t}^{\infty} e^{-r\tau}(ku - pu^2 + fx - gx^2)d\tau$$

$$dx = (u - mx - n)\,d\tau + sx\,dz$$

The general principles of optimal forest management rules are determined via optimal control theory, dynamic programming and computer codes.

The forest management objective function parameters gradually change over space as a function of the changes of the conditions of fundamental importance to forestry.

As a result, optimal forestry methods gradually change over space.

Continuous cover forestry in Switzerland. This is probably also profitable in large parts of Eurasia.

There are enormous options in the Forests of Eurasia if we optimize the activities!

Conclusions and Questions

- **It is very important to determine the optimal forestry principles to be used in Eurasia in detail.**

- **In order to determine these optimal forestry principles, resources are needed: A research budget to cover the costs of a four year project, performed in Eurasia, with ten researachers and other necessary things. Total cost: 4 Million EURO. Peter Lohmander is interested to be scientific leader of this project. It is necessary that professors from MSFU and other organizations in Eurasia are also included in the project as leaders of different parts of the project.**

This is an extremely profitable project for Eurasia.

The profits in Eurasia will be very much higher, global warming problems can be managed and other environmental improvements will be obtained!

QUESTIONS:

Who are interested to cooperate with me?

How do we obtain necessary funding to cover the total cost?

Thank you for your time!

Questions and Suggestions?

Please write an e-mail and/or visit my web site!

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References:

Most references are available from this website:
http://www.Lohmander.com

References from Moscow:

- Lohmander, P., Methodology for optimization of coordinated forestry, bioenergy and infrastructure investments with focus on Russian Federation, Moscow State Forestry University Forest Bulletin, ISSN 1727-3749, No 84, Issue 1, 2012

- Lohmander, P., Zazykina, L., Methodology for optimization of continuous cover forestry with consideration of recreation and the forest and energy industries, Moscow State Forestry University Forest Bulletin, ISSN 1727-3749, No 84, Issue 1, 2012