



Session 4: “Measuring sustainability: The overall impacts, synergies and trade-offs”

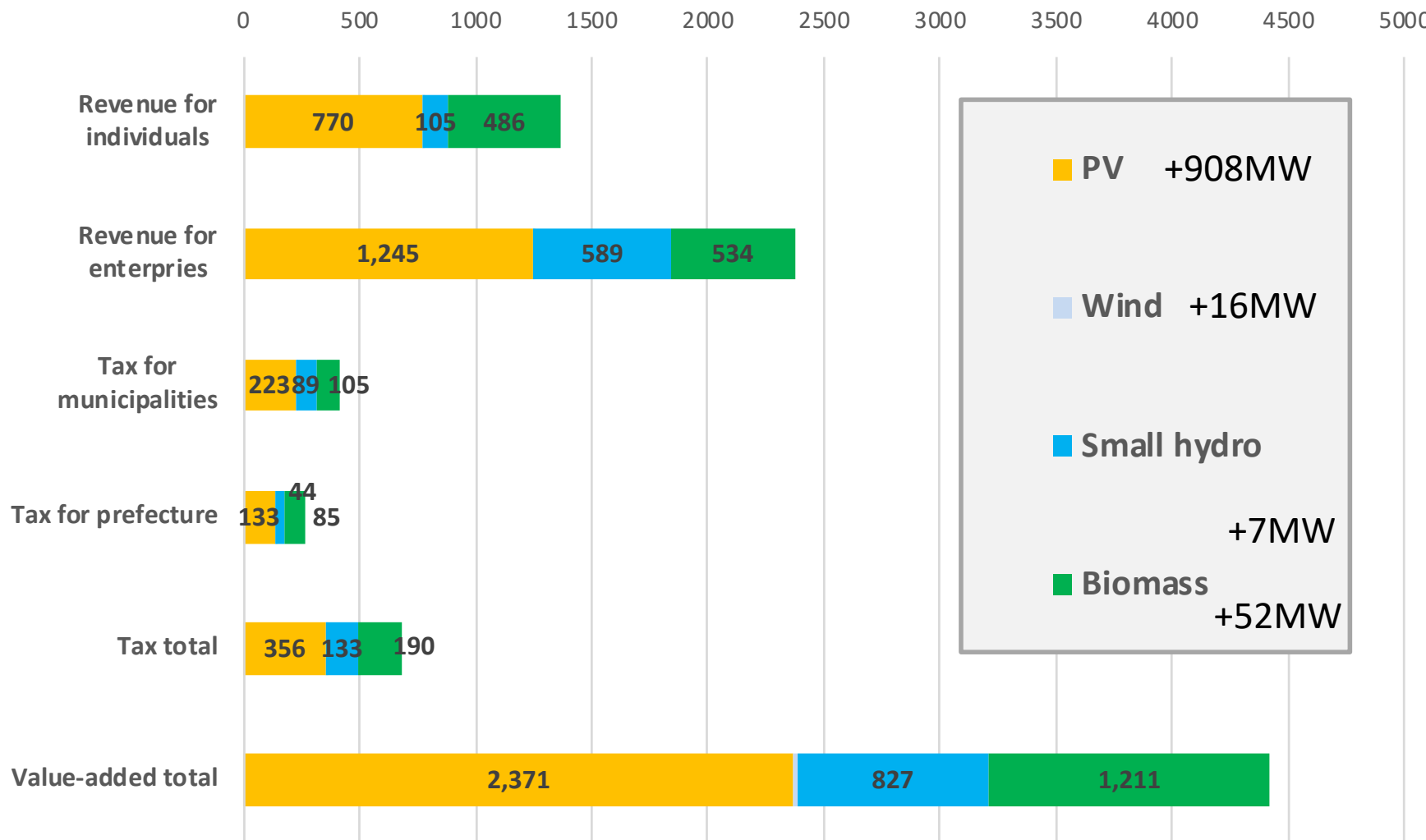
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Economic benefits of decentralized bioenergy

<Economic benefits of local renewables, case of Nagano>

(1.000ha)



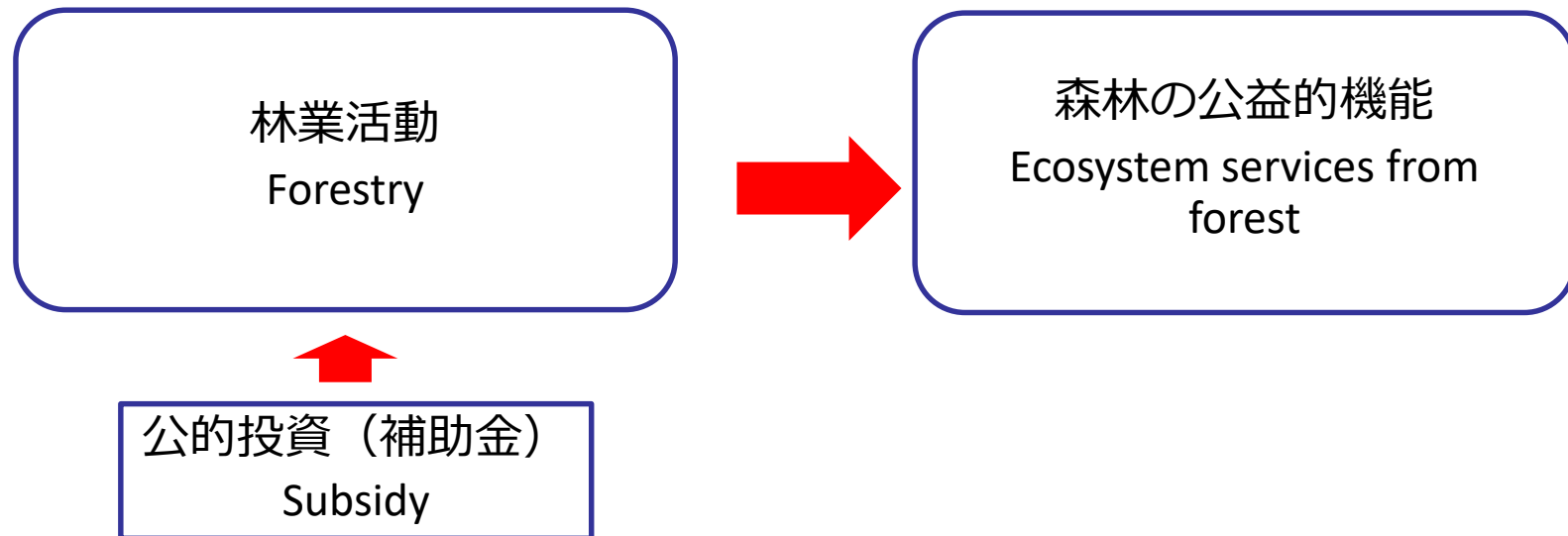
Source) Raupach (2018)

<Yamanashi prefecture in 1950>



Source) Forestry Agency, Japan

■予定調和論：林業活動が活発化すると森林の公益的機能が高まる？



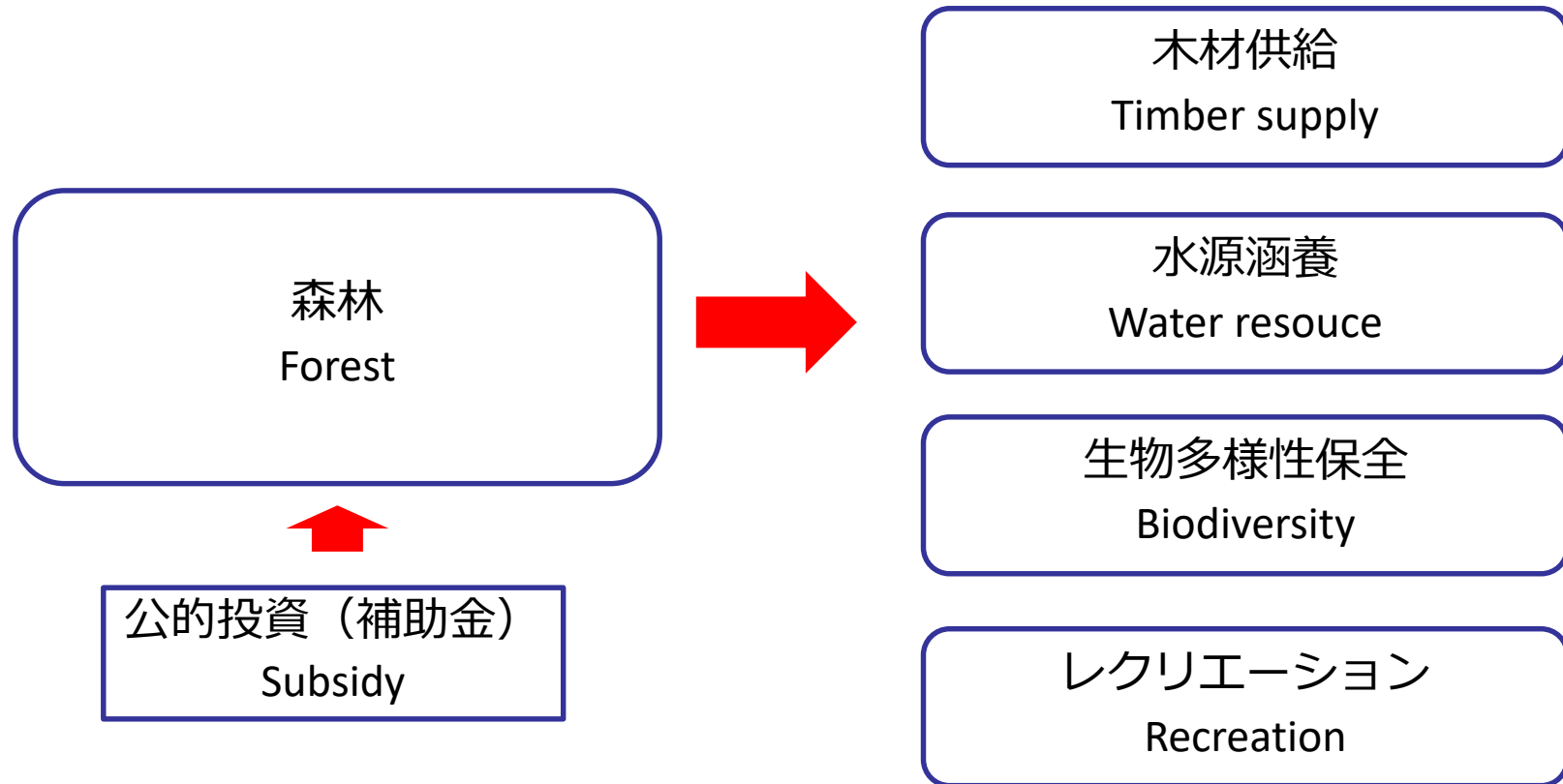
**Afforestation has improved multifunction of forests,
but harvesting doesn't always lead to as expected.**

<Certified forest area by major countries>

	FSC	PEFC	Total	% in total
Japan	403.6	1,333.2	1,736.8	6.9%
Austria	0.6	3,111.1	3,111.7	80.7%
Finland	1,611.2	17,784.5	19,395.6	87.8%
Germany	1,156.1	7,424.2	8,580.3	77.5%
Sweden	12,237.3	11,549.7	23,787.0	83.2%
Switzerland	616.2	208.9	825.2	66.5%
UK	1,604.1	1,409.8	3,013.8	104.6%
USA	53,861.1	33,748.4	87,609.5	28.8%
Canada	14,434.5	138,148.3	152,582.8	49.2%

Source) PEFC Global Statistics: SFM & CoC Certification (December 2017), FSC Facts & Figures (June 1, 2018)

Japan's certified forest area is limited so far...



Management to fulfill multifunction of forests

<Log price for biomass power>

	JPY/t-wet	JPY/m3
Hokuriku	6,189	3,899
Shikoku	9,291	5,853
Kyushu	7,106	4,477
Average	8,450	5,324

Note) Water content 50%, unit conversion: 0.63t/m3

Source) JWBA Survey (July-September, 2017)

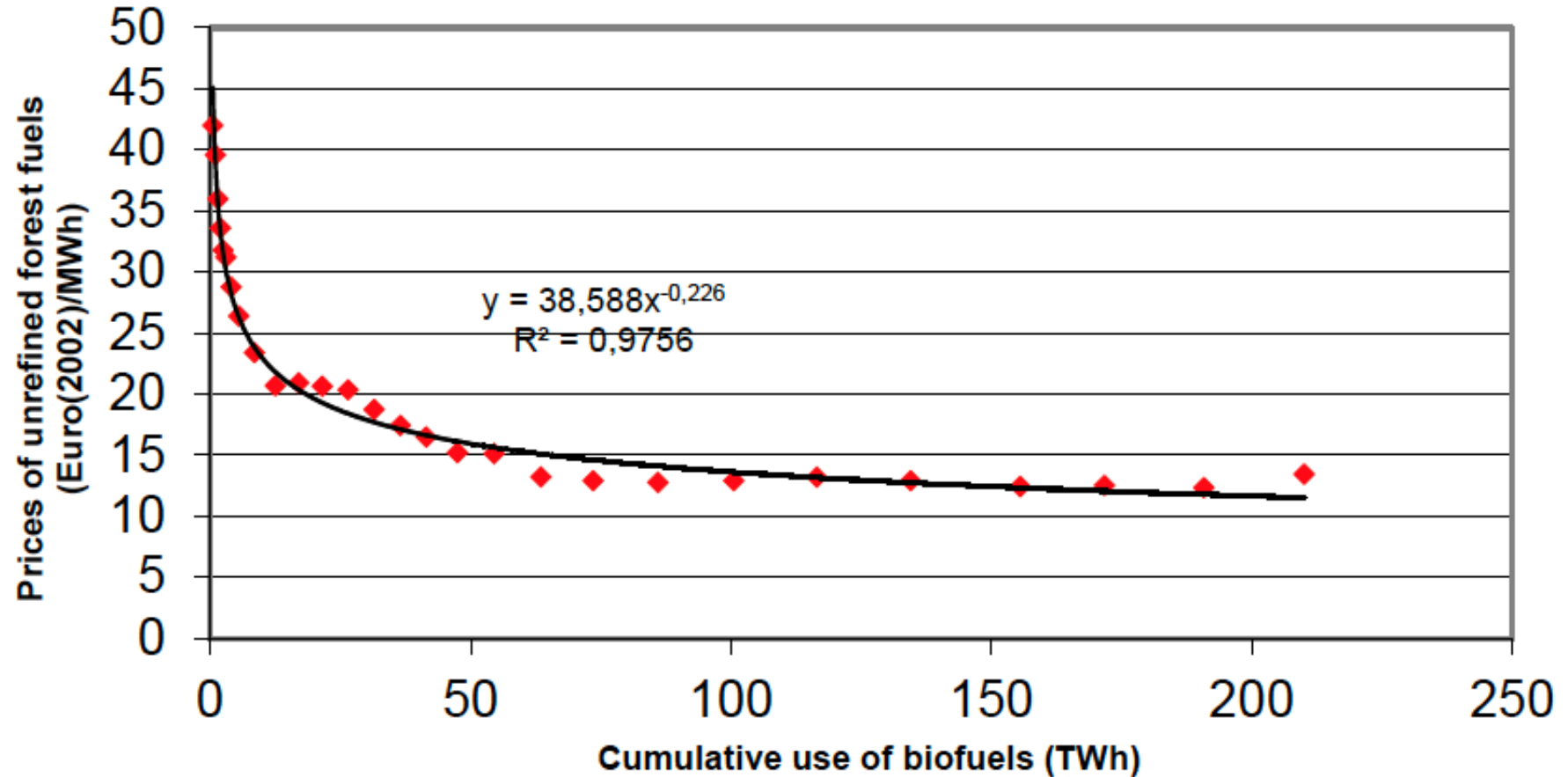
<Log price for pulp>

JPY/m3	2016	2017	May, 2018
Conifer	5,600	5,700	6,000
Broadleaved	9,000	9,100	9,200

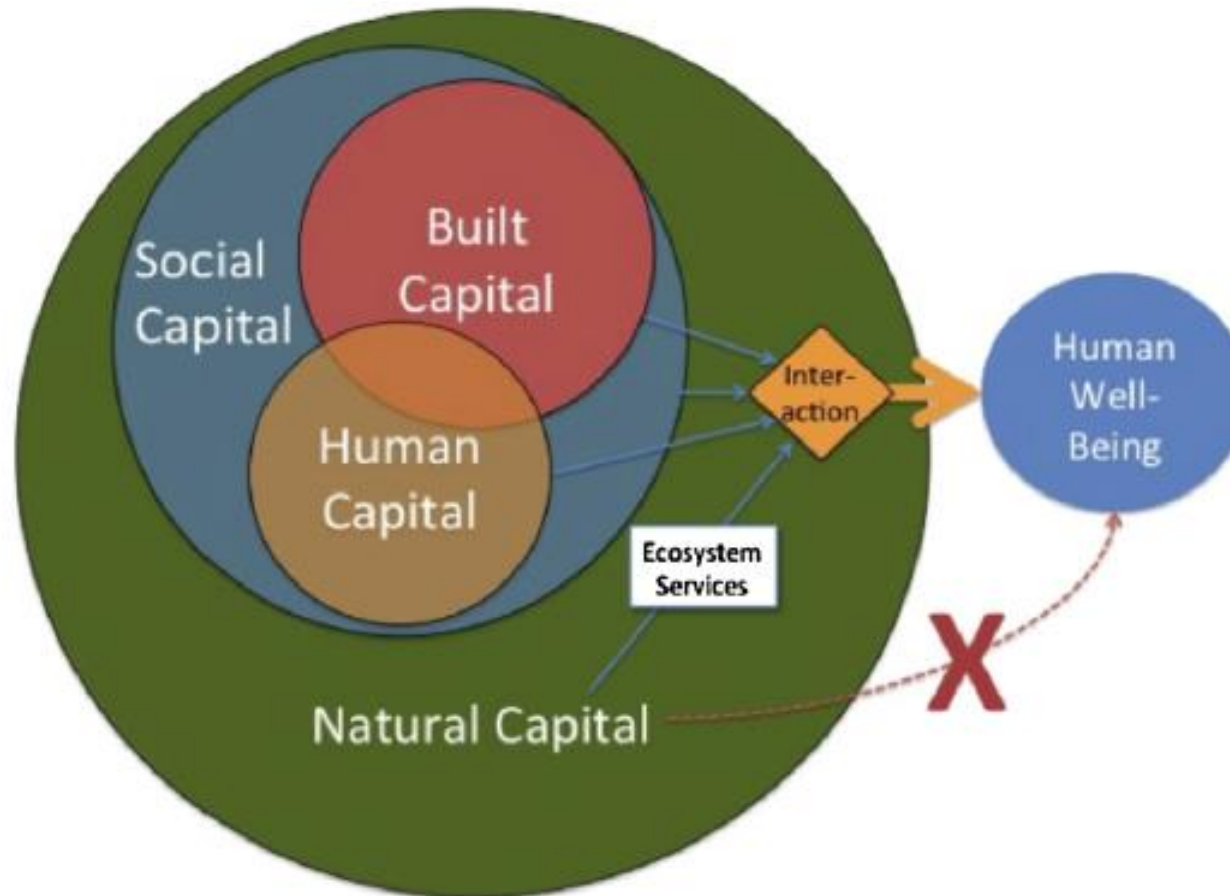
Source) Wood Price Survey by Forest Agency



<Cost reduction of unrefined woodresidues in Sweden 1975-2003>



Natural capital is not enough



Source) Costanza et al, (2014)



■ Information

- Enabling to make plans (owners, boundaries, forest property)

■ Road network

- Access to sites, transportation of wood

■ Physical capabilities

- Safety, cost

■ Monitoring system

- Target setting, PDCA
- Assessment of operational results (cost & profit, impacts on future growth of forests)

Public investment could be justified for infrastructure development

- 森林については、その有する国土の保全、水源のかん養、自然環境の保全、公衆の保健、地球温暖化の防止、林産物の供給等の多面にわたる機能（以下「森林の有する多面的機能」という。）が持続的に発揮されることが国民生活及び国民経済の安定に欠くことのできないものであることにかんがみ、将来にわたつて、その適正な整備及び保全が図られなければならない。
- 森林の適正な整備及び保全を図るに当たつては、山村において林業生産活動が継続的に行われることが重要であることにかんがみ、定住の促進等による山村の振興が図られるよう配慮されなければならない。
- 林業については、森林の有する多面的機能の発揮に重要な役割を果たしていることにかんがみ、林業の担い手が確保されるとともに、その生産性の向上が促進され、望ましい林業構造が確立されることにより、その持続的かつ健全な発展が図られなければならない。

林業活動が活発化すると森林の公益的機能が高めるというロジック

- In consideration of the indispensableness of sustainable fulfillment of the multiple roles that forests play through preservation of national land, water resources, natural environment, public health, prevention of global warming and supply of forest products (hereinafter referred to as the "multifunctional role") in maintaining the stable life of the citizens and the national economy, adequate efforts shall be given for the development and preservation of forests for the future.
- In consideration of the importance of continuous forest production activities in mountain villages, necessary consideration shall be given for the promotion of such areas including promotion of the settlement of people for adequate development and preservation of forests.
- In consideration of the fact that forestry plays an important role in the fulfillment of forests' multifunctional role, sustainable and sound forestry development shall be promoted by securing the workforce, improving the productivity, and establishing a desirable forestry structure.

Source) Japanese Law Translation (<http://www.japaneselawtranslation.go.jp/law/detail/?id=50&vm=04&re=02>)