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Iceland: Issues in Taxing Natural Resources

**Conference of Committee on natural resources policy in Iceland
and the Prime Minister's Office**

Reykjavik, June 22, 2012



What's so special about resources?

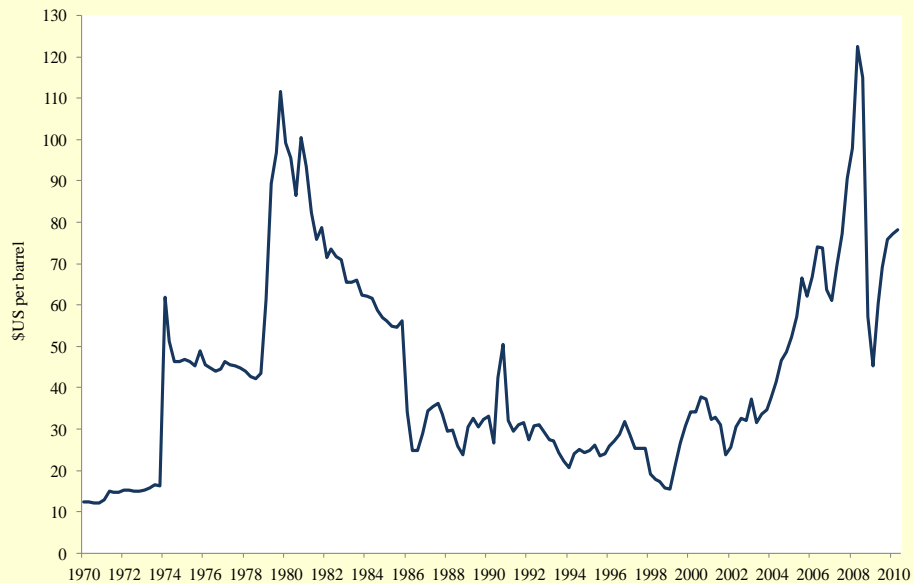
- Size of sector (even individual projects) relative to the economy
- Tax revenue is the central benefit to host country
 - Linking other economic development a continuing challenge
- High sunk costs, long production periods
 - Create 'time consistency' problem
- Substantial rents
 - The ideal of a non-distorting, immobile tax base!
- International considerations loom large
 - Foreign tax rules matter
 - Tax competition



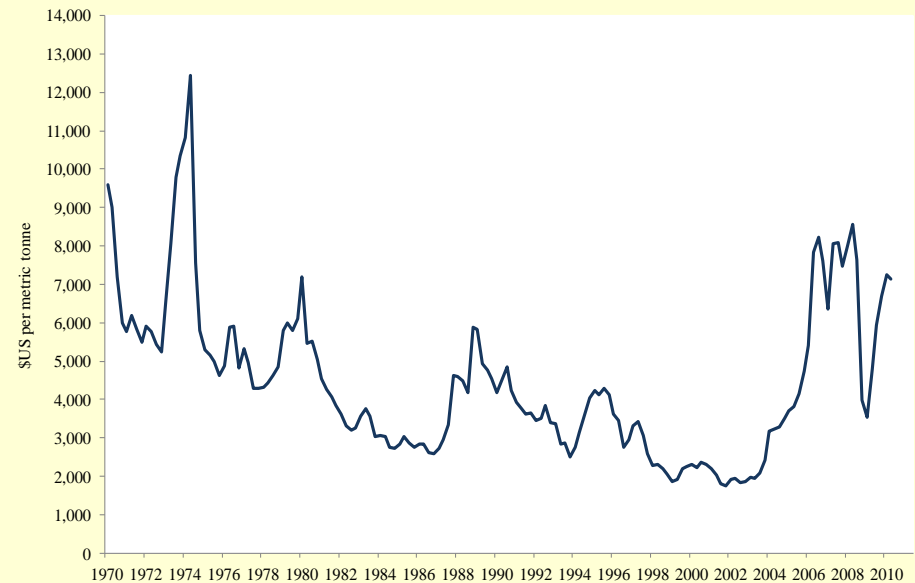
Uncertainty

- From geology, technology, price volatility...

Crude oil (real 2010 prices)



Copper (real 2010 prices)

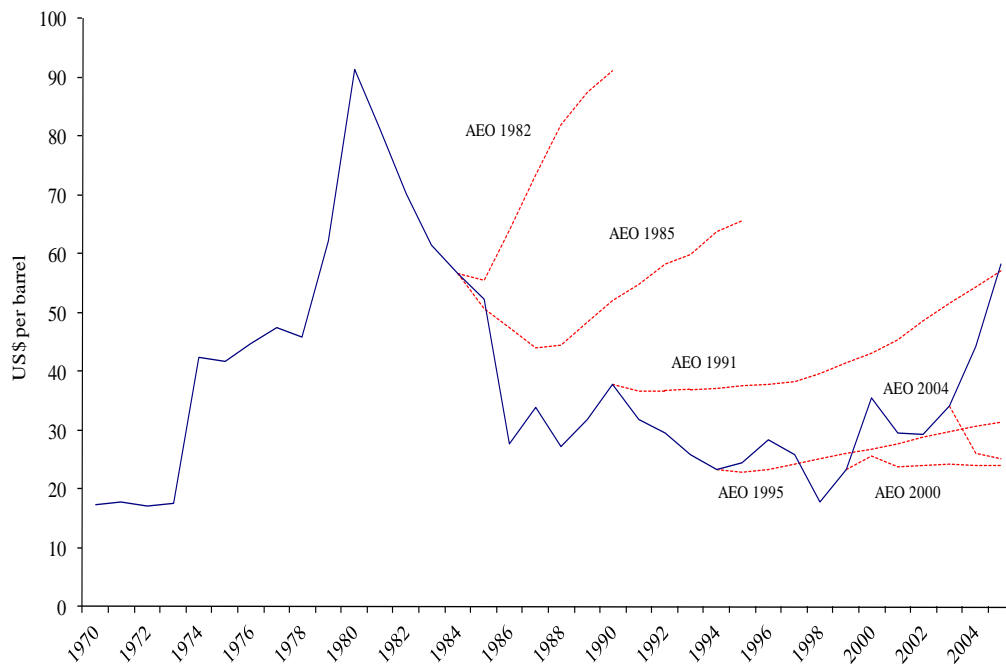


- ...and political risk

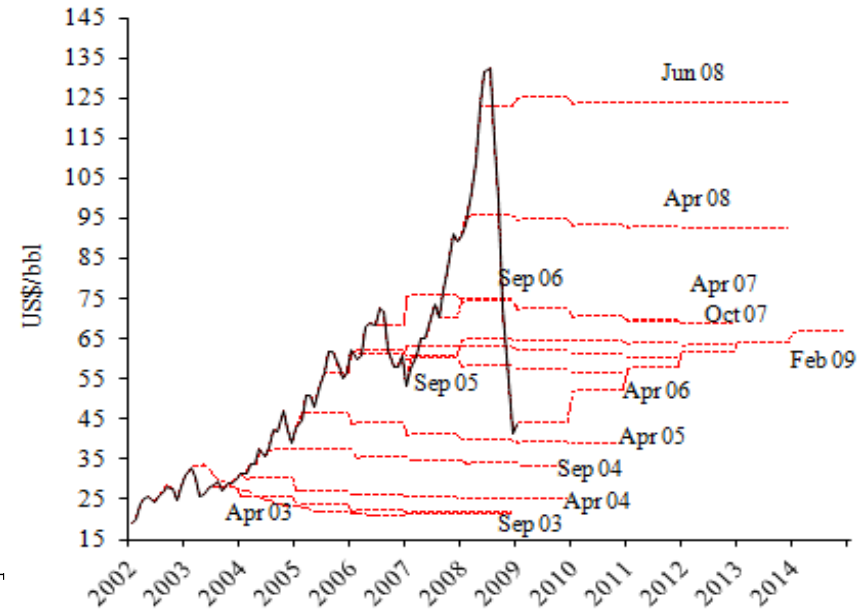


Forecasting prices is hard...

U.S. Department of Energy Annual Energy Outlooks (AEO) 1982-2004
(2006 U.S. Dollars per Barrel)



WEO Oil price Forecasts, 2003-2009
(U.S. Dollars per Barrel)



Sources: U.S. Department of Energy Outlook (1982,1985,1991, 1995, 2000 and 2004); and IMF World Economic Outlook (2003,2004,2005,2006,2007, 2008, and 2009). After Ossowski et. al. (2008)

Note: Solid lines on the left chart are spot WTI oil prices, on the right chart are WEO average of WTI, and Fateh. The dashed lines are price projections.



What else?

- Asymmetric information

Few of these are unique to resources—they're just bigger.

What is unique for minerals and petroleum is:

- Exhaustibility

- Opportunity cost of extraction includes future extraction forgone
- Views differ on how important this is in practice
- Recognize revenues as transformation of finite asset in the ground into financial asset

Not true for hydro, geothermal, or fisheries but they are **degradable**



Key principles of natural resource taxation

- see, for example, *The Taxation of Petroleum and Minerals*
- and...the draft *Natural Resource Charter*.



The key points...

- Fiscal terms must be robust in the face of changing circumstances.
- Should provide government with a revenue stream in all production periods, but also with an increase share of revenues as profitability increases (progressivity).
- Establish by law, or published contracts. Minimize discretionary and negotiated elements.
- Specialized incentives should be avoided.
- Stability and credibility.



The key points...

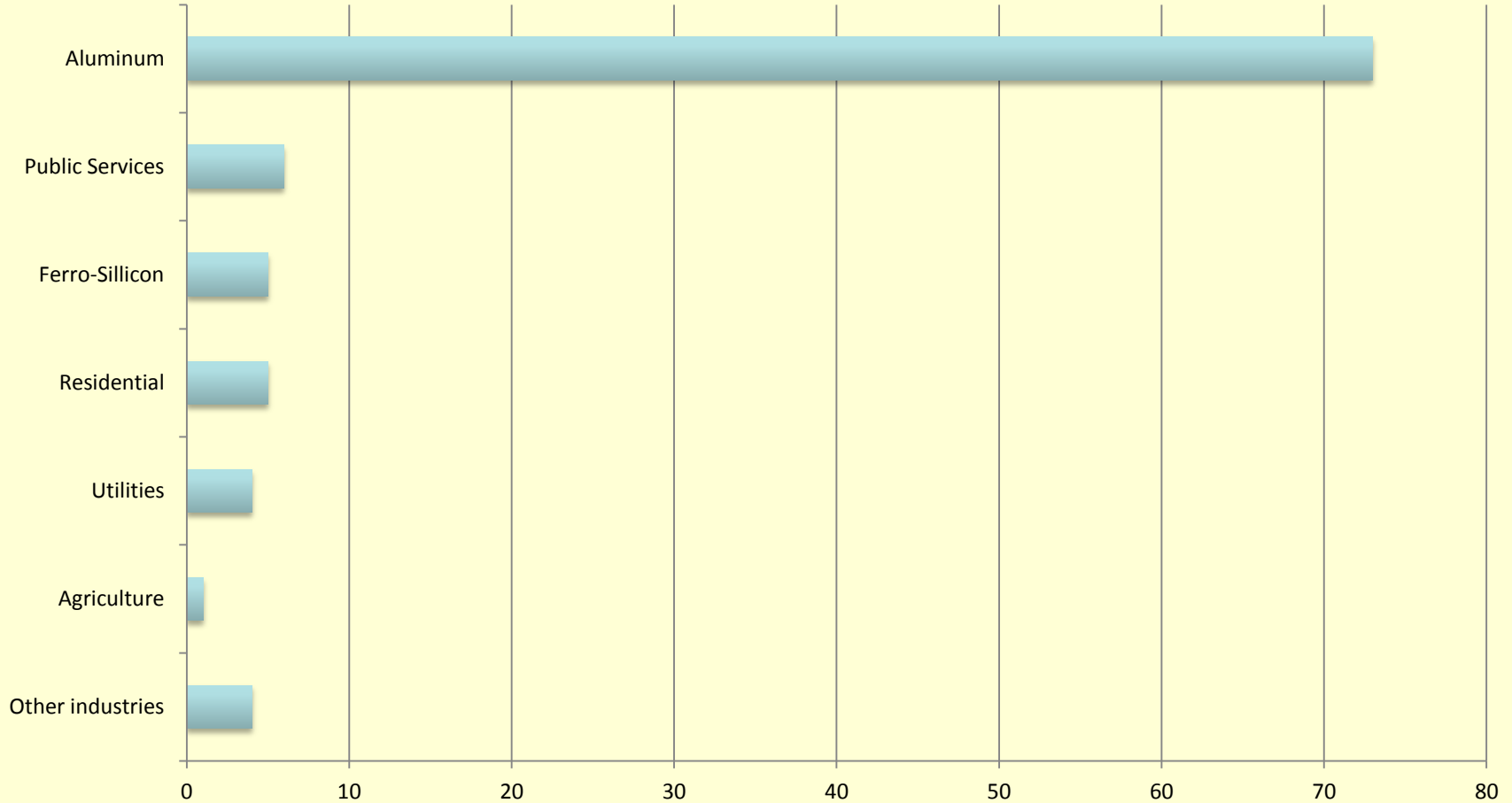
- Tax and royalty, production sharing, and state equity can all be made fiscally equivalent.
- Different contract structures can apportion risks differently, and affect stability and credibility.
- Need to make data for key assessments in the regime observable and/or verifiable.
- Opportunities for aggressive tax planning should be minimized.
- Overall fiscal regime must take account of relative capacity to bear risk.



Overview: hydropower and geothermal

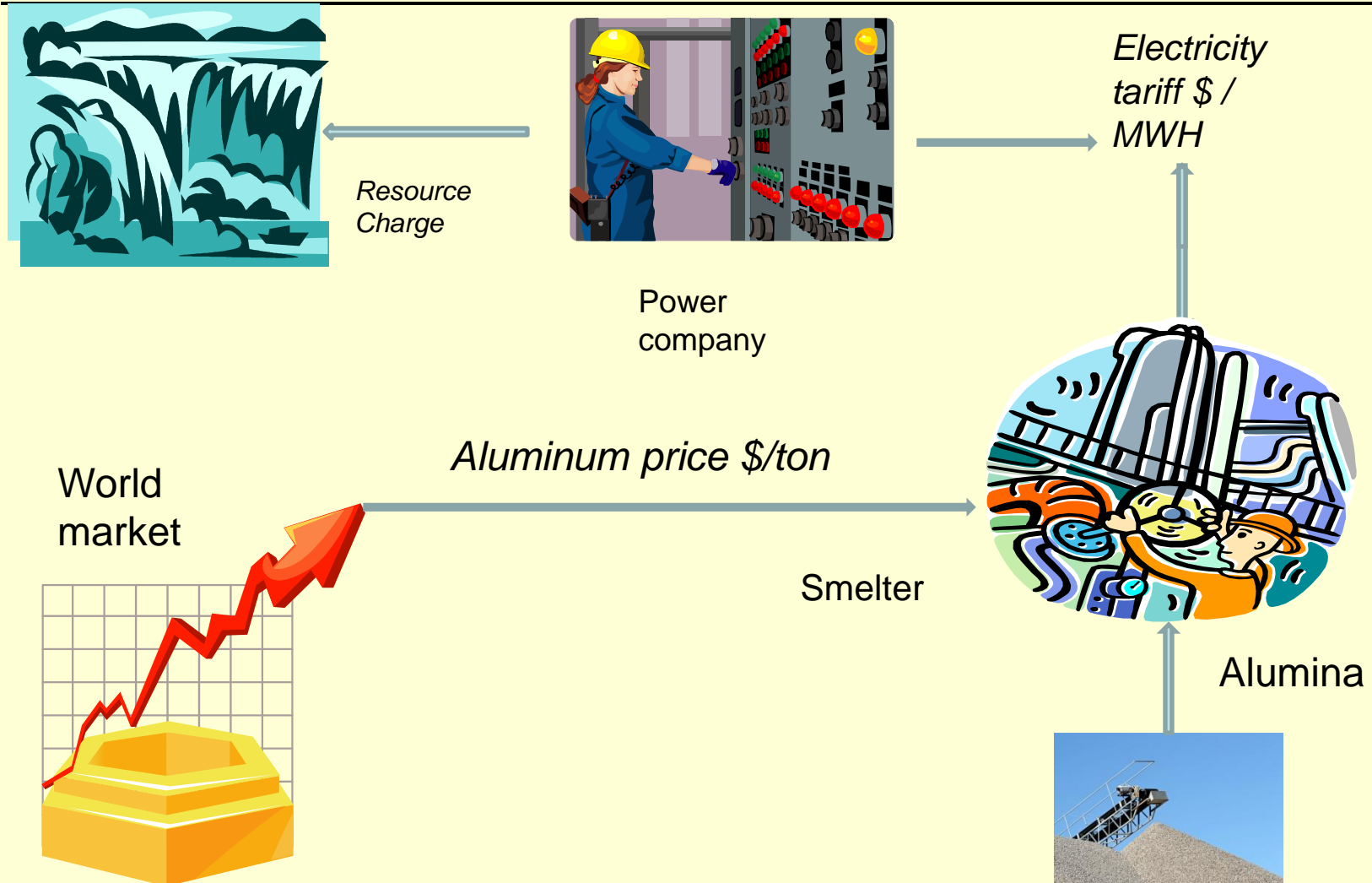
- Measuring rents in hydropower (geothermal)
 - Analyses for Canada & Switzerland
 - Who captures the rent?
- Taxation regimes in a selection of countries
 - Norway, Canada & Switzerland
- Simulating a geothermal project
 - Five regimes of taxation
 - Incentives, revenue & progressivity
- Some recommendations

Electricity use in Iceland by sector

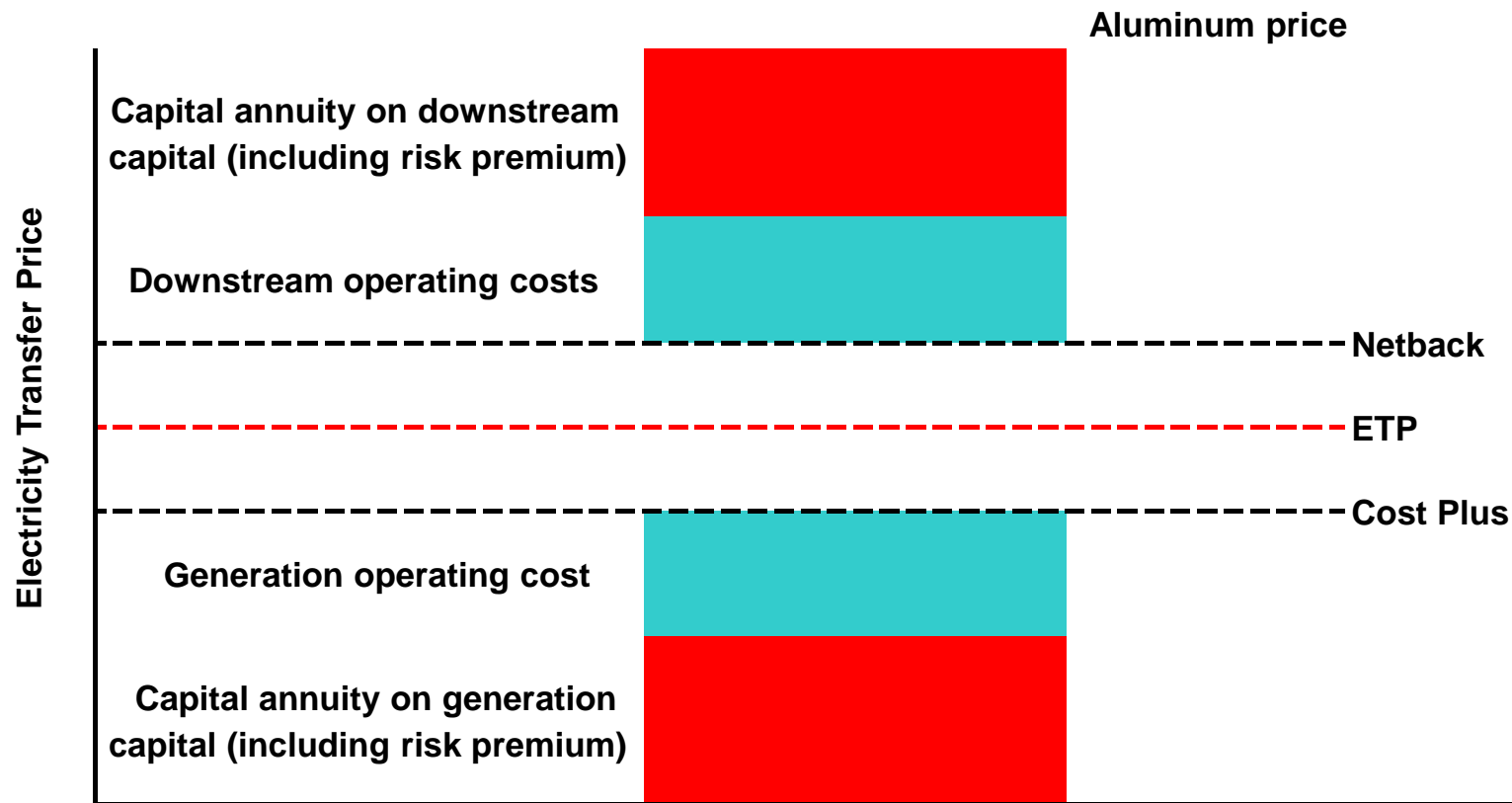




Integrated Projects: “Find the Rent”



Pricing in integrated projects

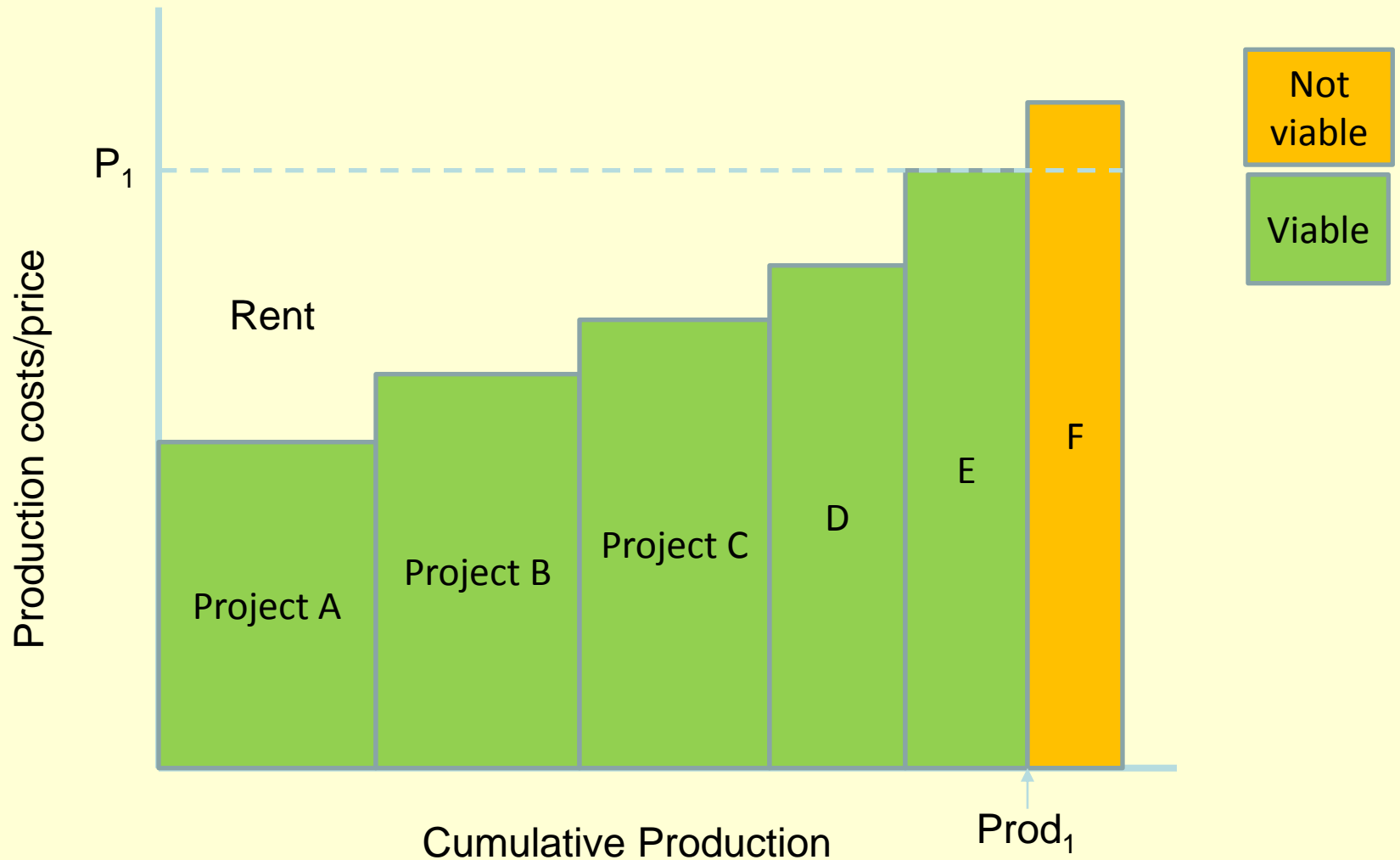


Source: Australian Government (Department of Resources, Energy & Tourism)



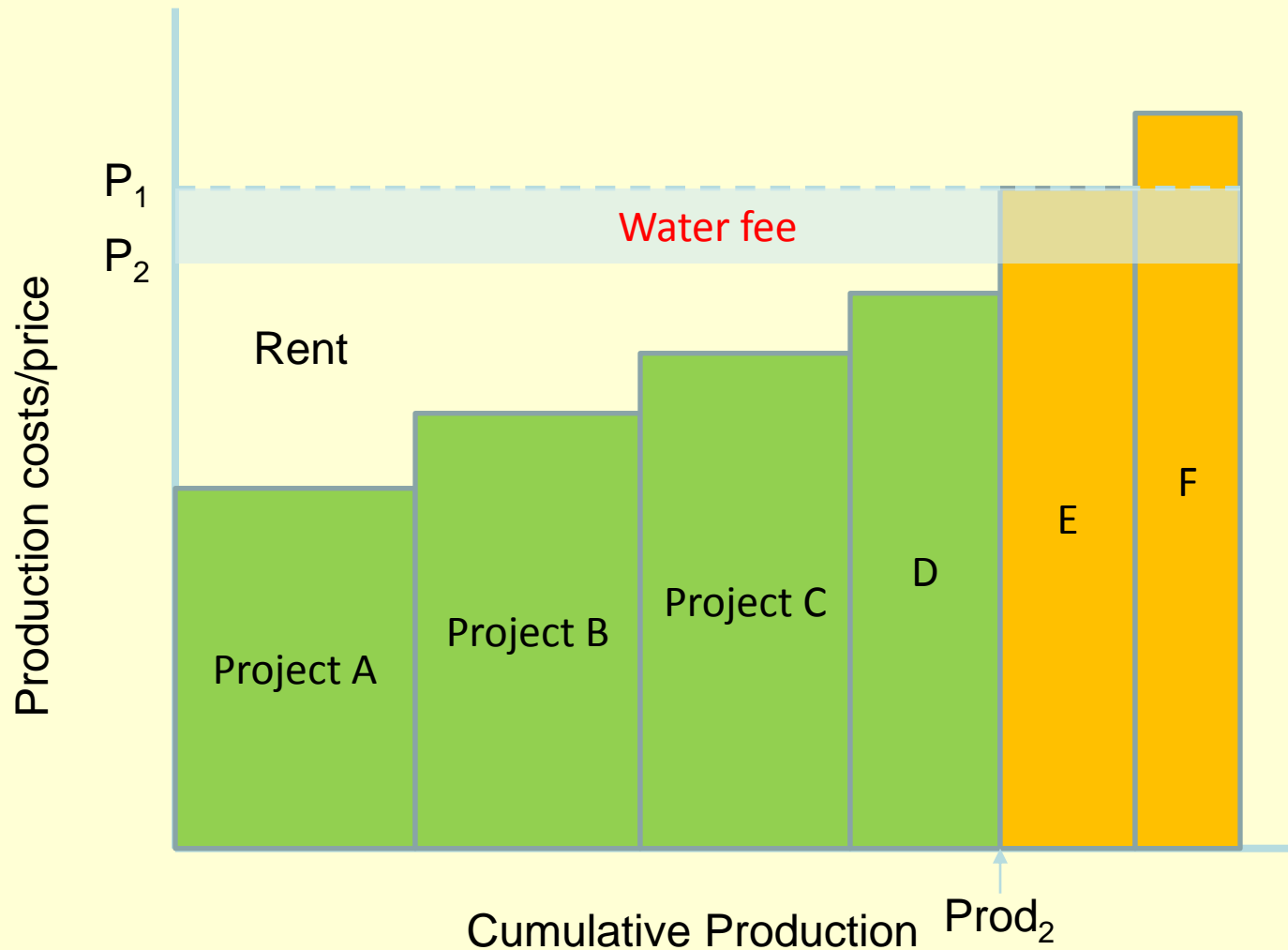
MEASURING RENTS

Resource rent



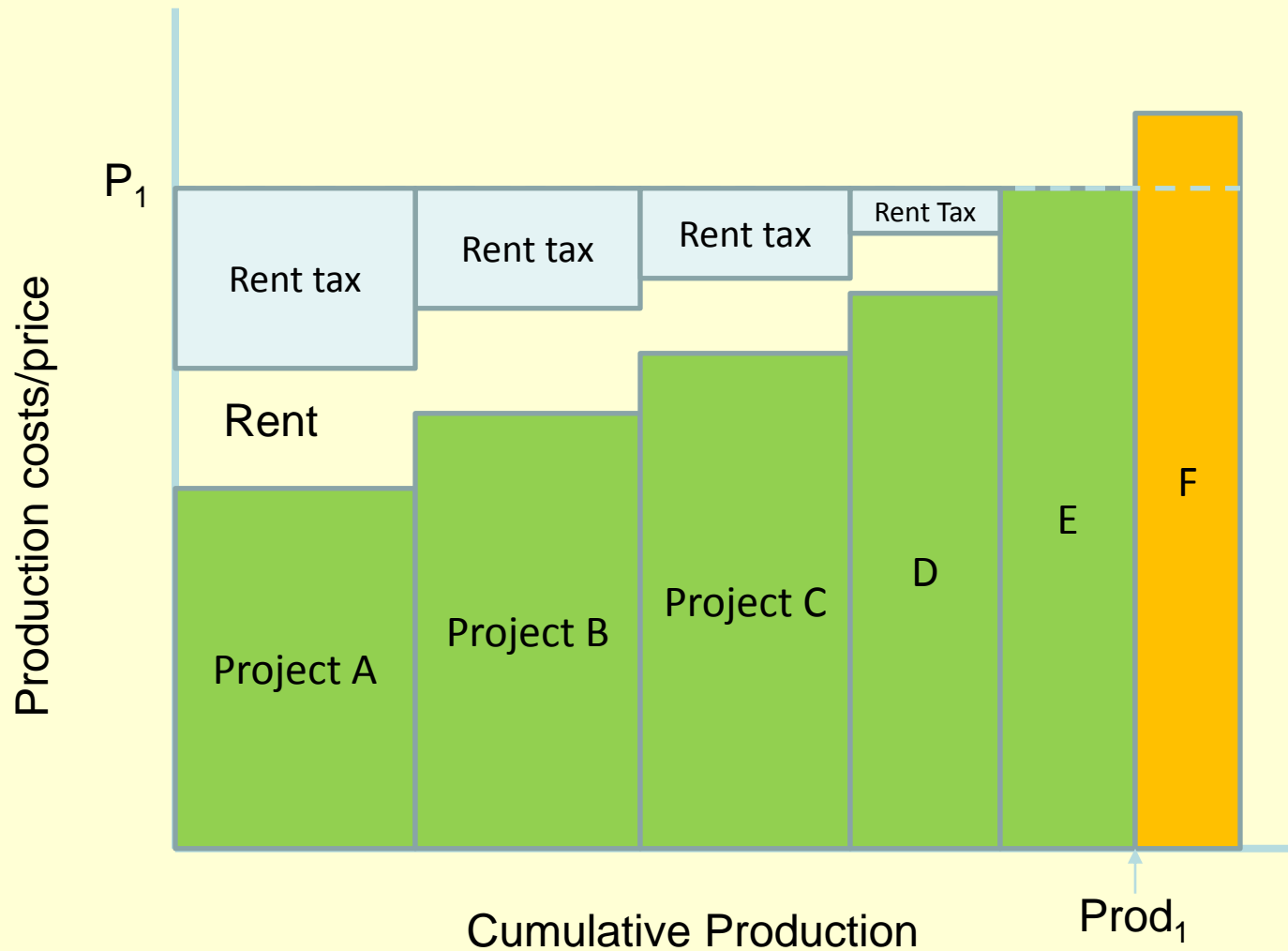


Effect of water fee or extraction levy





Resource rent tax – “neutral”





From theory to estimation ...

- What's the correct price of electricity?
 - Price from domestic supply & demand
 - Price from international market (direct/indirect)
- What's the correct unit cost?
 - The marginal supplier of power
 - Distinguishing rents from quasi rents
- What's the average infra-marginal plant?
 - Complications
 - Externalities, base-peak load, mixed projects



Hydroelectricity in Ontario, Canada

- Electricity price = export price recent project
 - \$41.06 /mwh
- Cost = Ontario hydro plant, incl. cost of capital
 - Unit cost \$7.18 / mwh
- Rent is \$ 33.88 /mwh (almost 5 x unit cost)
- Earlier Canadian studies find:
 - 1st: Using estimated unit cost → rent \$9.11 /mwh
 - 2nd: Same → rent \$36.58 / mwh

D. Gillen and J.-F. Wen, 2000, Hydroelectricity in Ontario, Canadian Public Policy 26, 35-49



Hydroelectricity in Switzerland

- Run-of-river versus storage plants
- Electricity prices: base-peak price averages
 - Run-of-river: €36.40 /mwh; Storage: €62.40 /mwh
- Unit cost = Average Swiss plants
 - Run-of-river: €26.50 /mwh; Storage: €39.00 /mwh
- Rent
 - Run-of-river: €10.70/mwh; storage: €22.80/mwh



Who captures the rent in Iceland?

- (Unit) production cost low, especially when compared to renewables elsewhere
 - Carbon pricing will only make Iceland more competitive
 - Most profitable hydro projects already undertaken
- Pricing in the ‘cable scenario’
 - Sell at Nord Pool spot price: 2011 between € 55 and € 65 / mwh



Pricing in an isolated market

- Key = industry contracts
 - Existing contracts: prices from € 25.7 /mwh up
- New contracts
 - Who: state-owned – private?
 - Corporate governance matters
 - Specific long-term investments (quasi-rents)
 - Iceland on world competitiveness scale?
 - Trade-offs: commitment-flexibility; risk-return
 - Link to aluminum price/electricity prices?
 - Transparency & portfolio diversification



TAXATION REGIMES FOR HYDRO/GEOTHERMAL



Water fees

- Switzerland: 'Wasserzinse' paid to municipalities
 - In 2010 appr. €9.0 / mwh (20-30% of unit cost)
- Canada: 'Water rental charge' paid to Ontario government
 - In 2000: \$3.44 / mwh
- France 'hydro rate'
 - In 2008: €9.20 / mwh

Norwegian Hydro Rent Tax

- Introduced in 1997
- Tax rate 30 %, on top of CIT rate of 28% gives a rate of 58%
- Base:

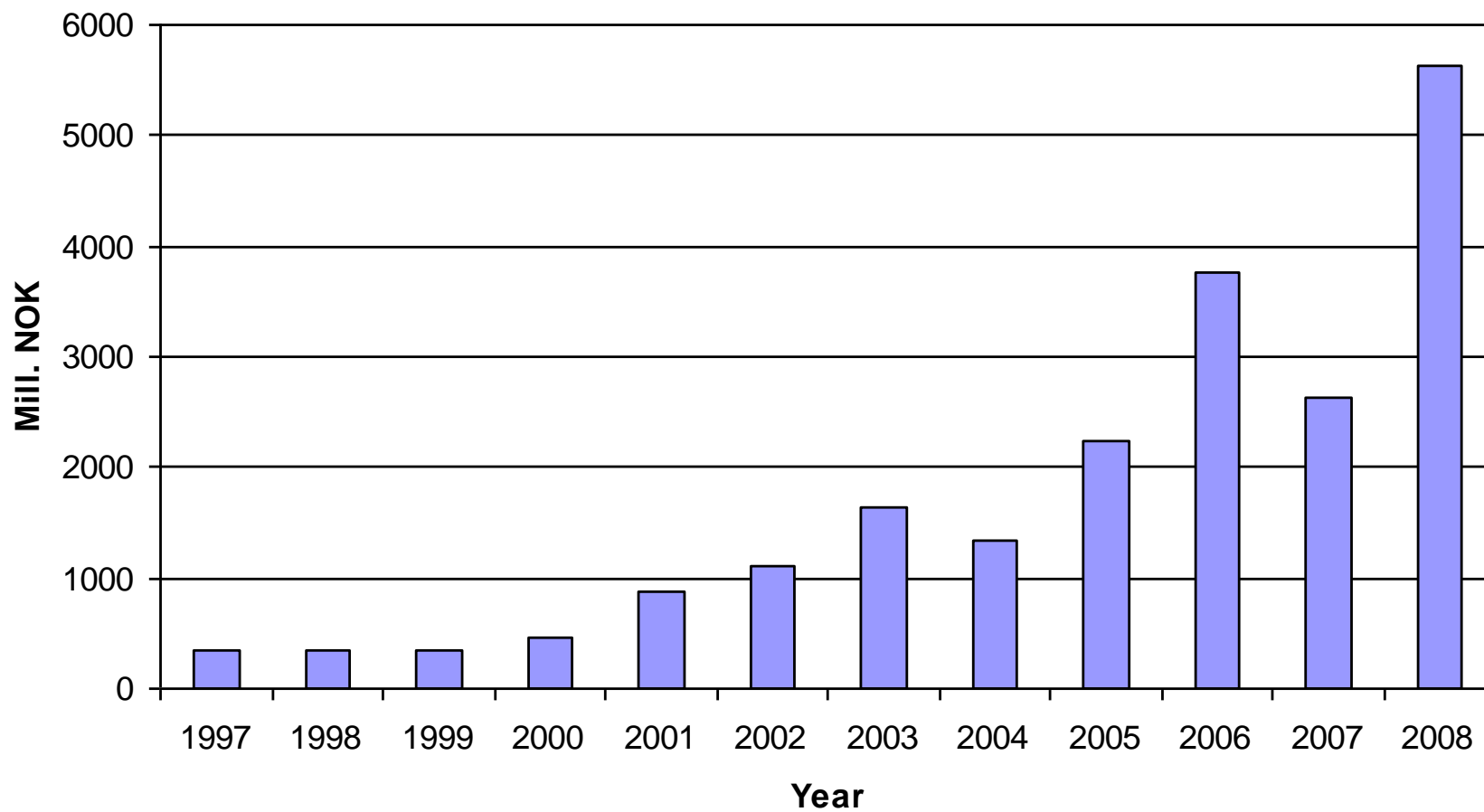
Sales income (market prices)

- Operating costs
- Depreciation (linear: installations 1,5%; equipment 2,5%)
- Uplift (undepreciated asset value * 5.2%)
- = Tax base liable to **30% tax**





Norway: Revenue from RRT 1997-2008





Simulating hydro and geothermal projects



Assumptions for two simulated power projects

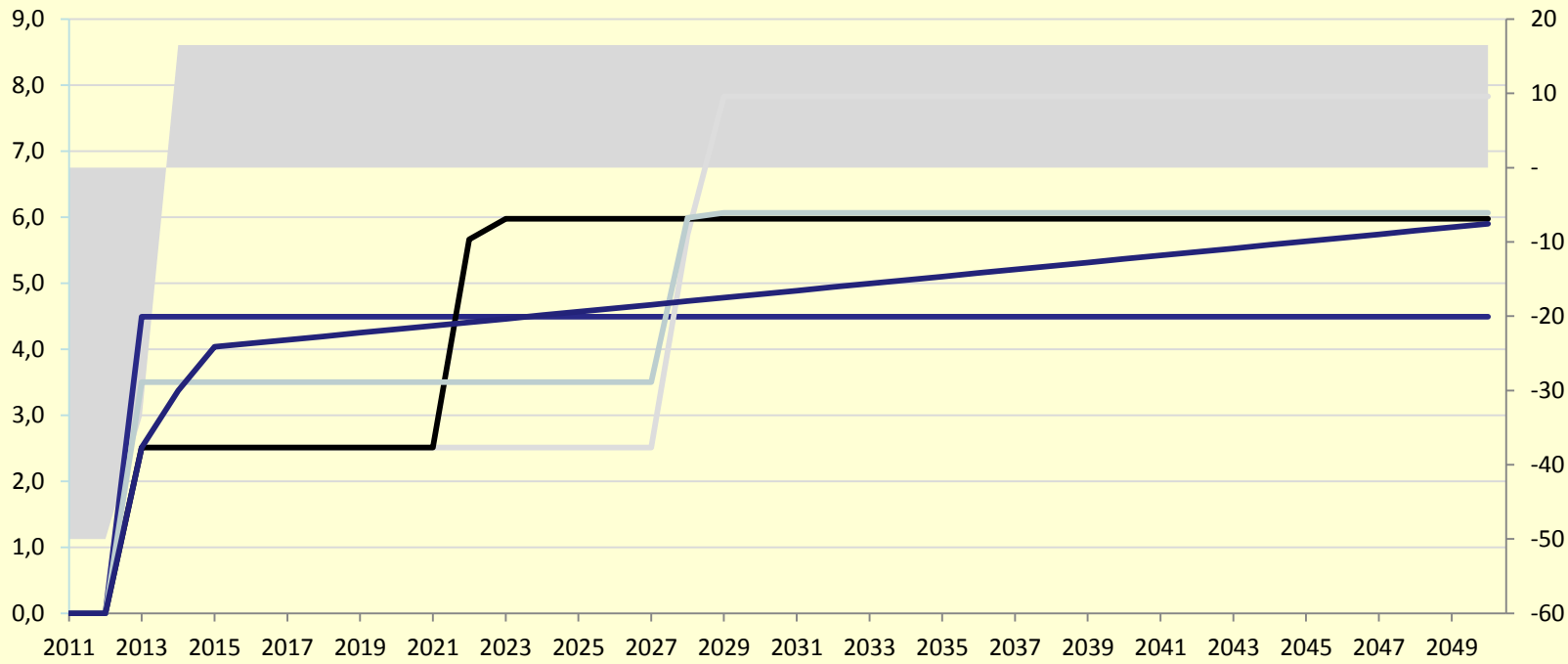
| | Hydropower project | Geothermal project |
|-------------------------|---|---|
| Capacity | 100 mw | 100 mw |
| Production per year | 825 gwh | 825 gwh |
| Capital expenditure | US\$153 million (Yr 1, 50; Yr 2, 50; Yr 3, 50) | US\$120 million (Yr 1, 50; Yr 2, 50; Yr 10, 10; Yr 20, 10) |
| Operating cost | US\$10 per mwh | US\$15 per mwh |
| Sale price | US\$30 per mwh | US\$30 per mwh |
| Project life | 55 years | 35 years |
| Assumed discount rate | 5 percent | 5 percent |
| Internal rate of return | 10¼ percent | 10¼ percent |



Simulating 5 alternative tax regimes

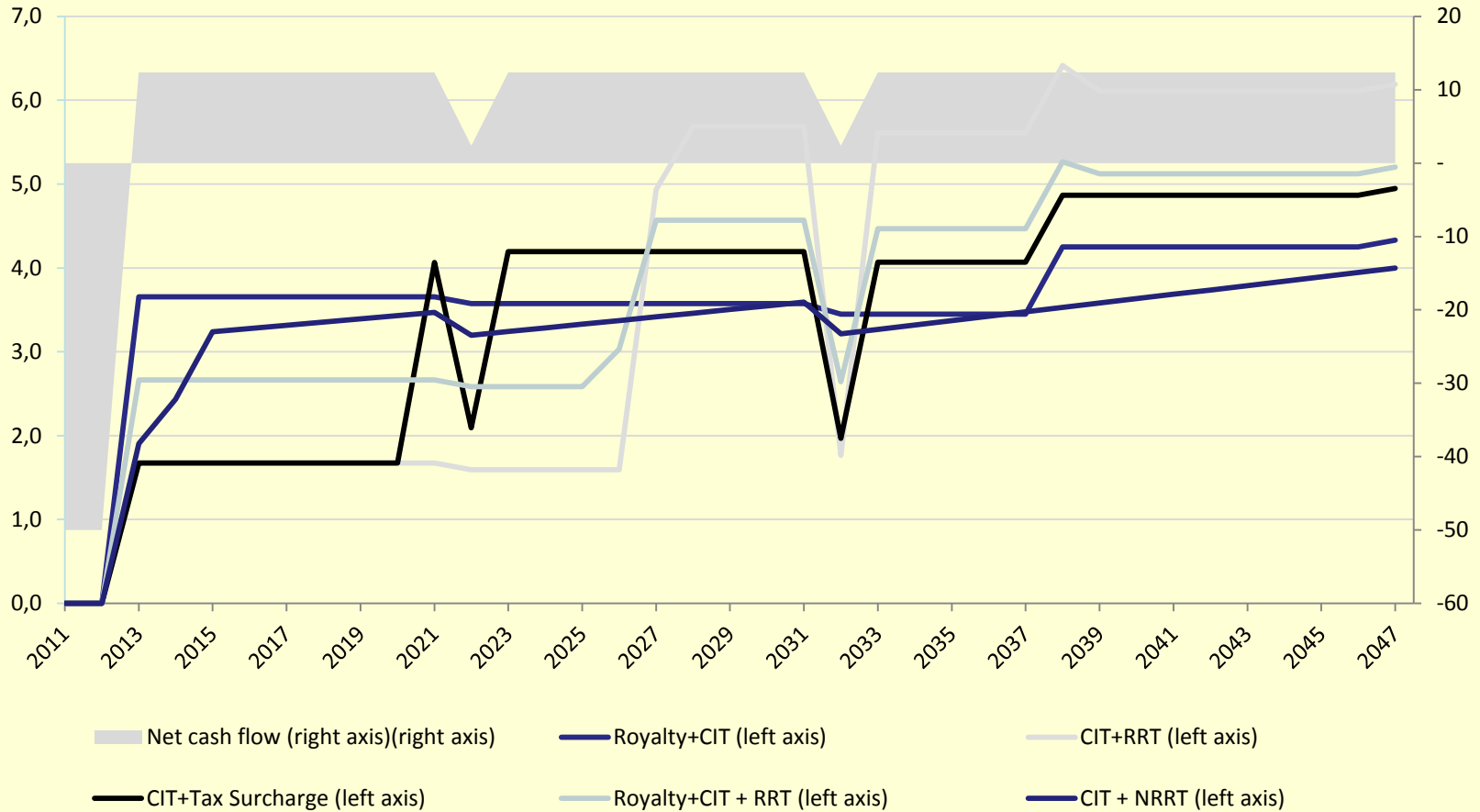
1. 20% CIT + Royalty regime
 - Water charge 10% of sales, deductible for CIT
2. 20% CIT + Resource rent tax 38%
 - CIT deductible for RRT; RRT levied once NPV > 0, computed at 5% discount rate
3. 20% CIT + Cash-flow tax 21%
 - Cash-flow surcharge: CIT not deductible
4. 20% CIT + Mixed regime
 - Water charge 5% & RRT 18%
5. 20% CIT + Norwegian-style ACC (NRRT)
 - at 27% on CIT base, no deduction of interest, 5% annual uplift on undepreciated balance of assets.

Hydroproject pretax cash flows and government revenue profile (\$mm real)



- Net cash flow (right axis)
- Royalty+CIT (left axis)
- CIT+RRT (left axis)
- CIT+Tax Surcharge (left axis)
- Royalty+CIT + RRT (left axis)
- CIT+NRRT (left axis)

Geothermal project pretax cash flows and government revenue (\$mm real)





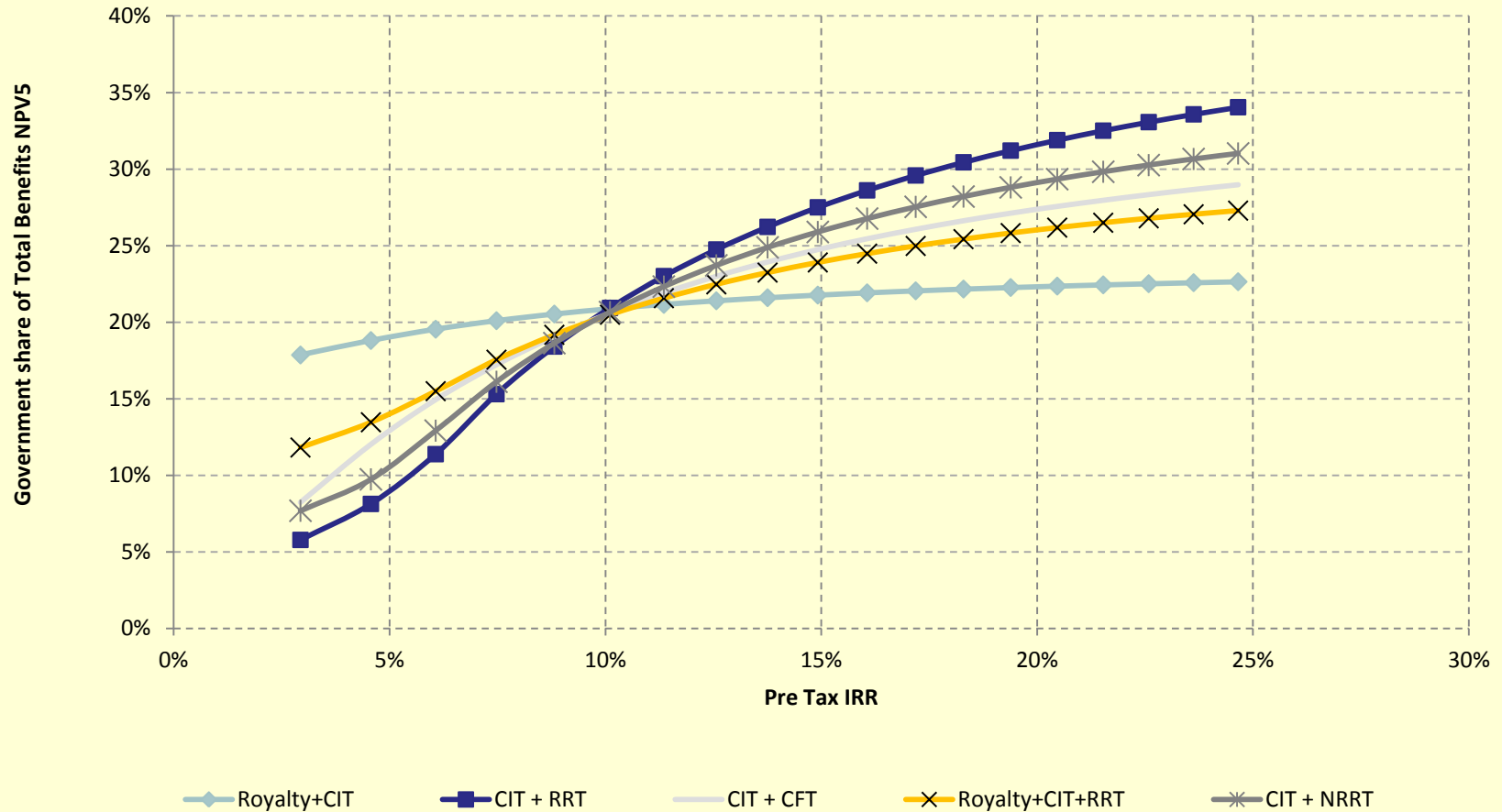
METRs under 5 Regimes

| | Hydro project | Geothermal project |
|---------------------|---------------|--------------------|
| CIT + Royalty | 24.0 | 27.6 |
| CIT + RRT | 21.0 | 24 |
| CIT + CFT | 22.2 | 25.2 |
| CIT + Royalty + RRT | 22.7 | 25.7 |
| CIT + NRRT | 22.0 | 25.7 |

Geothermal Project Tax Progressivity

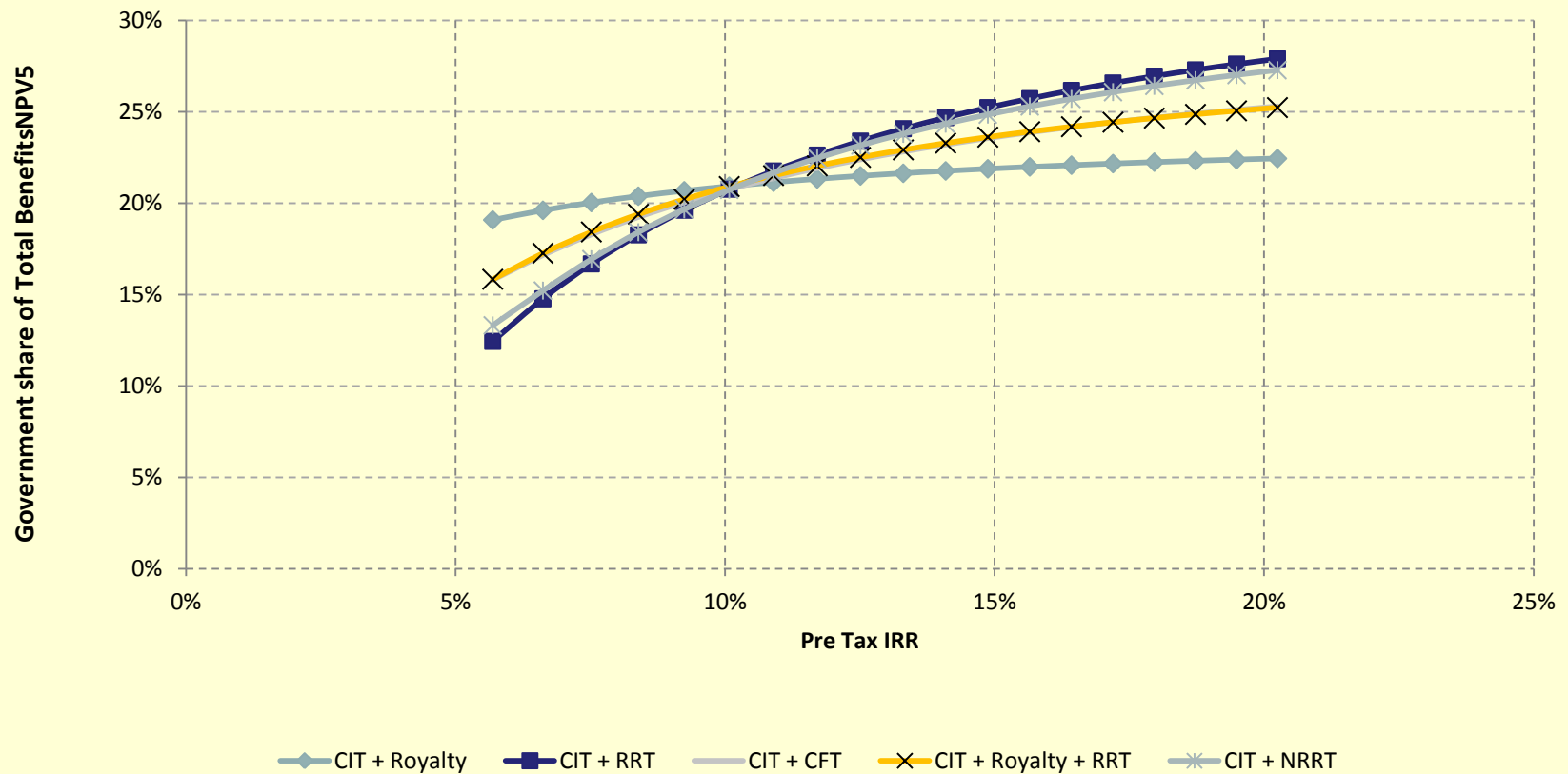
Correlation of Government Revenue and Profitability

(Measured by IRR)





Hydro project tax progressivity





Lessons

- Do not expect quick revenue!
- Water charges: early revenue, but distortion of investment & not progressive
- RRT: non-distorting and progressive, but late revenue and requires high rate
- Cash-flow tax: earlier generation of revenue & non-distorting, imperfect loss offset (ring-fenced)
- ACC type of rent tax has worked well in Norway



Market structure

- Current
 - Landsvirkjun: state-owned, 72% of market
 - Reykjavik Energy: local government-owned, 16%
 - HS Orka: now privately owned, 8%
- Raises several issues for Iceland
 - Level-playing-field public & private in licenses
 - Dividend- vs tax policy of public enterprises
 - Sovereign liability for investment in power sector

Natural Resource Taxation

(Allocation of Rights)



- Move in steps towards **consolidation of publicly-owned resource rights into a single entity**.
- Prepare for **resource allocations by auctions** and by transparent comparison of proposals; consolidate resource assessments into packages of resource leases that are offered for investment projects.
- **Link the duration of leases to the flexibility of resource charges**; continue to grant easily renewable long leases where a progressive resource charge is applied.
- Set the base **extraction levy in relation to anticipated environmental costs**; make additional extraction levy a bid variable at auctions.
- **Introduce a resource charge** geared to the achieved results of a project.
- **Permit transferability of rights**, to affiliates, upon sale or farm-in, and for third party financing, subject to regulatory safeguards.

Natural Resource Taxation

(Ownership and Competition)



- Improve transparency by **encouraging publication of electricity prices** in existing contracts with aluminum smelters (and mandating for the future), and by **separating accounts** of entities in government-owned power companies.
- Create a **level playing field** between government and privately owned power companies.

Natural Resource Taxation

(Power-Generating Companies)



- Adopt an **extraction levy** at a **percentage of electricity sales (or fixed \$ amount per MWH)**; adjust this in specific cases for the estimated environmental costs.
- Adopt a **resource tax for access to rights**, either under the cash flow tax surcharge scheme, or under the ACC scheme.
- If the **cash flow surcharge** is adopted, consider adding a **one-time uplift** for capital investment
- For integrated projects, review the **feasibility of overall rent taxation**, or of a **capital attribution and residual pricing mechanism** to establish the transfer price of electricity.
- For existing projects, use written down asset values for tax purposes, possibly with a one-time uplift, to establish the **starting tax base**.

Natural Resource Taxation

(Energy-Intensive Industries)



- **Avoid sudden** measures to **increase fiscal levies** on energy-intensive industries; focus instead on securing fair market value for electricity sales.
- Allow **existing incentives legislation** to **expire as scheduled**, without replacement, and allow investment agreements to expire as agreed.
- Consider **elimination of tax stability assurances for new projects** in future, or at least limiting them to rates of specific taxes rather than to deductions and tax calculations in general.

Natural Resource Taxation

(Offshore Petroleum Resources)



- Revise the petroleum fiscal terms to include an **extraction levy at a modest flat rate, normal CIT,** and a **simple special hydrocarbon tax.**
- Consider a different model for **special hydrocarbon tax** (not geared to a profit ratio calculation), such as a **cash flow surcharge or an ACC scheme.**
- Permit **unincorporated joint ventures** to apply for and hold petroleum licenses.