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BY THE COMPTROLLER GENERAL

# Report To The Congress

OF THE UNITED STATES

## The Congress Should Consider Exploring Opportunities To Expand And Improve The Application Of User Charges By Federal Agencies

Federal agencies provide goods, services, and privileges that benefit identifiable recipients. Charging for these benefits is equitable since it assures that costs are borne by beneficiaries, rather than taxpayers in general. Full cost pricing also ensures that products whose costs exceed their benefits will not be produced. Items that are publicly owned or regulated but not produced should, on economic grounds, be priced so as to equate use with supply. Prices should be no less than fair market value, except in certain cases.

Deviations from these general pricing rules may sometimes be needed. Prices may have to be lowered to permit access by those with low incomes or to encourage consumption of some product. Prices may have to be raised or lowered in the presence of external costs and benefits, respectively. Also legal considerations may restrict the full implementation of some pricing practices that are desirable on economic grounds.

The Congress could require agencies to examine their present pricing practices and to make changes or to recommend to the Congress legislation required to comply with the pricing guidelines discussed in this report. Employing charges could be regularly considered in designing future Federal programs.



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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

This report contains guidelines for pricing goods, services, and privileges that the Federal Government provides to identifiable recipients. It also outlines an approach that the Congress could follow to obtain the information needed to implement these guidelines. We have undertaken this review to assist the Congress in assessing current user charge policy, and in affecting any desired changes in this policy.

A handwritten signature in black ink, appearing to read "Thomas P. Staab".

Comptroller General  
of the United States



COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

THE CONGRESS SHOULD CONSIDER  
EXPLORING OPPORTUNITIES TO  
EXPAND AND IMPROVE THE APPLI-  
CATION OF USER CHARGES BY  
FEDERAL AGENCIES

D I G E S T

User charges promote economy and efficiency in Government operations. They address two current public policy problems, taxes and regulation. User charges can help reduce general Federal tax collections by partially substituting for taxes and by reducing the demand for goods and services whose production is currently financed by general tax receipts. They can also reduce the costs to business and society of complying with certain types of Federal regulations.

This report describes principles and pricing practices which, from the standpoint of economic efficiency, would be beneficial if adopted by the Congress in formulating user charge guidelines. (See pp. 16 and 17.) This is not to imply that these principles could always be adhered to. In addition, other social policy objectives might sometimes justify departing from the objective of maximum economic efficiency. Nevertheless, adopting these principles would permit a more informed comparison between a policy based on economic efficiency goals and that actually being pursued. The consequences of deviating from equitable and economically efficient pricing principles could be more accurately assessed. It is in this sense that GAO believes this document to be of use to the Congress.

A note of caution is called for regarding these pricing principles. Sometimes there might be legal impediments to the full implementation of pricing practices that would be beneficial on economic grounds. Thus the legality of implementing any pricing practice must always be determined before any action can be taken. (See pp. 6 to 8.)

PAST AND PRESENT FEDERAL  
USER CHARGE POLICY

User charges have been employed by the Federal Government since its inception. The importance of charges in the Federal budget has varied. Presently they account for about 3 percent of total receipts. (See pp. 5 and 6.)

Many GAO studies on particular user charges have revealed problems.

- Pricing practices are inconsistent both within and across agencies.
- The total costs of providing special benefits are not always being collected.
- The Government may be earning less than fair market value on the leases of some of its properties.

The existence of these problems indicates a need for a comprehensive review of Federal user charge policy. As a result, existing charges might be changed or charges might be imposed where none now exist. (See pp. 4 and 5.)

THE EQUITY AND EFFICIENCY  
OF USER CHARGES

User charges that collect the total cost of goods produced and services provided at public expense place these costs on those who benefit, rather than on other taxpayers who do not. User charges that collect total costs may also act as a market test, assuring that the benefits derived are at least as great as their production costs. (See pp. 13 to 15.) Also charging for goods and services allocates them to those who value them most highly (and perhaps to those best able to afford them).

PRINCIPLES OF PRICING FOR  
ECONOMIC EFFICIENCY

Produced goods

These principles apply to goods and services, the supply of which is not fixed. But they could be adjusted by the Government's making additional expenditures on some production process.

- When identifiable individuals are the recipients of goods produced and services provided at Government expense, charges should be levied which will cover the production costs incurred on behalf of the recipient. (See p. 19.)
- Incremental production costs should be reflected in price when possible, consistent with the objective of recovering full production costs. (See pp. 19 to 21.)

Nonproduced goods

These principles apply to goods, the supply of which is fixed either by natural limits (e.g., Outer Continental Shelf oil and gas) or as a matter of policy (e.g., the right to use fluorocarbons).

- When nonproduced goods are controlled (through ownership or regulation) by the Government but are used for the benefit of identifiable individuals, charges should be levied which will equate the amount of the goods desired at those charges with the supply. (See p. 24.)
- If consistent with law, the charge that will "clear" the market may either be determined in advance, such as through appraisal techniques for determining fair market value, or be established through a mechanism for auctioning the supply. (See pp. 24 to 27.)

## EXCEPTIONS TO PRICING FOR ECONOMIC EFFICIENCY

These principles are aimed at maximizing economic efficiency, an important goal of Government. But other social policy goals might, in particular situations, warrant deviation from these principles. For example, it might be appropriate, because of potential benefits to society, to encourage the consumption of some goods (e.g., food, shelter, and education) by charging less than their full cost or fair market value. Similarly, it might be appropriate to assure low-income individuals the opportunity to benefit from certain Government-provided goods and services by reducing charges. (See pp. 10 and 11.) It would also be appropriate to adjust the charges when individuals not directly involved in the activity are affected (favorably or adversely) by a recipient's consumption of a publicly provided good or use of a public service. (See p. 22.) Finally legal and administrative factors must be considered. Charges may be levied only as permitted by law. And, in general, charges should not be imposed when the administrative costs of doing so would exceed the revenues collected. (See p. 18.)

## MATTERS FOR CONGRESSIONAL CONSIDERATION

There is a lack of information on user charges, and there is evidence that some present charges do not conform with the pricing guidelines discussed in this report. The Congress could:

- Require agencies to determine the correspondence between current user charges, whether mandated by statute or set by the agencies, and these principles.
- Require agencies to present this information to it through the Office of Management and Budget and then decide what changes, if any, were necessary.
- Amend existing legislation or instruct agencies to implement these changes, monitored and assisted by the Office of

Management and Budget. (See pp. 31 and 32.) Other matters for congressional consideration are discussed on pages 32 and 33.

GAO received comments from the Office of Management and Budget on a draft of this report, which expressed agreement with GAO's premise that those who receive special benefits from the Government should bear the associated costs. Also the agency expressed particular concern with the legal problems of imposing user charges. (See p. 33.)



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#### ABBREVIATIONS

EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FPC	Federal Power Commission
GAO	General Accounting Office
OMB	Office of Management and Budget

## CHAPTER 1

### INTRODUCTION

#### TIMELINESS OF THIS REPORT

This report gives the Congress a framework for addressing two major concerns of the American public and business community. Both individuals and businesses are concerned with tax burdens. Businesses are also concerned with the fact that compliance with Federal regulations is often expensive. Both concerns can be addressed by the Government's promotion of economy and efficiency through actively employing user charges. 1/

User charges can reduce Federal taxes, as well as the costs of certain types of regulation. They are a source of revenue that can partially replace general taxation of individuals and businesses. They also reduce the amount of taxes needed to finance the production of goods and the delivery of services to the extent that charging higher prices reduces recipient demand. As discussed in chapter 4, the costs to businesses of complying with certain regulatory goals (such as pollution control) would be lower if charges were used in lieu of regulatory standards. 2/ In all these ways, user charges promote the achievement of economy and efficiency in Government operations.

#### General definition of "user charges"

The term "user charge," as used in this report, refers to any charge collected from recipients of Government goods, services, or other benefits not shared by the public. This definition, which extends beyond the scope of the so-called User Charge Statute, 31 U.S.C. 483a, includes

--fees collected to offset the costs of  
goods, services, or privileges supplied  
by the Government;

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1/Broader considerations of equity and efficiency also argue for employing user charges. These considerations are also discussed in this report.

2/This has also been discussed in another recent GAO report, "Government Regulatory Activity: Justifications, Processes, Impacts, and Alternatives," PAD-77-34, June 3, 1977.

--prices for the sale, lease, or other use of Government property; and

--excise taxes designed to recover the costs of Government projects or services.

The first category includes charges for such things as licenses, publications, and certain Government services. In assessing fees, an agency can collect no more than the costs it incurs in providing the benefit. In calculating its costs, it must exclude the expenses of providing an independent benefit to the public.

The second category includes such charges as rentals for leasing Federal land, prices for selling timber from the national forests, and rentals for oil-drilling rights on the Continental Shelf. Under the U.S. Constitution, the Congress has complete authority over the disposal of Government property and in authorizing agencies to sell or lease this property, the Congress may set the conditions under which the sale or lease will take place. Therefore, the price which the Government may charge for the purchase or use of its property is not limited by the costs it incurs in disposing of it.

The third category of user charges includes (1) the Federal excise taxes levied on gasoline and certain automotive parts and paid into the highway trust fund and (2) the tax on fuel consumed by users of inland waterways. Our definition includes these taxes because they are levied on the individuals most likely to use the Federal project or service for which the tax is intended to pay. Under the Constitution, taxing power, including user charges in the form of a tax, may be exercised only by the Congress and although it may authorize an agency to collect a levy, the Congress must determine the activity to be taxed and the method for calculating the tax.

These categories of charges should be kept in mind throughout the pricing discussions in this report. The discussion in chapter 3 refers primarily to fees, while the discussion in chapter 4 refers primarily to sales and leases of Government property. It should also be kept in mind that agencies may collect charges only to the extent authorized by the Congress. In many instances pricing policy is set by the Congress through legislation, and a change in the policy can be effected only by a change in the legislation.

## OVERVIEW OF THE REPORT

This report primarily provides guidance for designing an equitable and efficient system of user charges. It should, therefore, be viewed as a normative inquiry into Federal user charge policies. It describes principles and pricing practices which, on economic grounds, would be beneficial if adopted by the Congress when formulating guidelines for imposing user charges. These principles could not, and should not, be rigidly applied in all cases. Sometimes implementation would require changes in existing law or would conflict with other social policies. Nevertheless, adopting the principles would facilitate a more informed comparison between a policy based on economic efficiency and that actually being pursued. Also, the costs and other consequences of deviating from equitable and economically efficient pricing practices could be more accurately assessed. We ask the Congress to consider investigating current agency user charge policies in light of these principles. We believe that because user charge policies and practices are generally set by statute, only the Congress may initiate such a review.

The report is divided into chapters that will likely be of interest to different readers.

This chapter provides background on the present employment of user charges and touches upon important legal problems associated with Federal user charge policy.

Chapter 2 provides pros and cons of user charges. It is directed toward the Congress and those in executive agencies who are in a position to initiate user charge policies.

Chapters 3 and 4 are largely technical. Their intent is mainly to provide guidance on the appropriate setting of user charges in different situations. The intended audience includes those in executive agencies who would be responsible for designing user charge systems.

The one section that would be of interest to all policymakers appears in chapter 3--"Limitations to incremental cost pricing"--in which we argue that user charges in the form of fees should cover the total cost to the Government of providing goods and services to particular recipients.

The final chapter contains our conclusions, matters for consideration by the Congress, and comments from the Office of Management and Budget (OMB).

Examples showing the employment of user charges appear in this report. Their use does not imply that we are

recommending adoption of user charges in these particular cases. Any such specific recommendation would require detailed analysis of individual cases, which is beyond the scope of this report. Examples are included solely to relate abstract arguments to concrete situations.

#### CURRENT USER CHARGE POLICIES

We have conducted many studies (see app. II) analyzing charges imposed by various Federal agencies. A common finding has been that agencies have failed to recover the total costs of special benefits conferred. Reasons include inadequate procedures for calculating direct and indirect costs; setting charges too far in advance of service delivery, which prevents raising charges to match cost increases that occurred in the interim; and specific legislation that prohibits payment for some services even while similar services provided by the same agency were being reimbursed at full cost. In most cases, we have recommended remedial administrative or legislative action to bring about full cost recovery.

Other studies have found inconsistencies across agencies in the charges imposed for similar benefits. These inconsistencies occurred even though there were no legislative mandates for dissimilar charges. Also inadequate data and analysis may have prevented earning of fair market value on the lease of some Government property.

As indicated above, there are cases when present user charge applications are clearly inconsistent with the pricing principles discussed here. But for the remainder there simply is not enough evidence to indicate general consistency or inconsistency. Consequently, we suggest that the Congress review user charge practices contained in statutes or engaged in by Federal agencies. A specific program by which such a review could be conducted is presented.

#### CONSIDERATIONS ON A REVIEW OF USER CHARGE POLICIES

As stated above, this report is primarily a document about the economic principles which should be considered in setting user charges, rather than a description of present Federal user charge policies. The tasks of determining current policies and comparing them with these principles are beyond our capabilities. Consequently, we acknowledge that the Government-wide review of user charge policies that we suggest could result in a finding that most agencies are complying with these principles. On the other hand, such a review could uncover wide discrepancies. Both findings would be significant. We simply lack the data needed to know what the results of such a review would be.

A Government-wide review would be fruitful, we believe, because

--there is evidence that the user charge policies associated with some programs are inconsistent with the pricing principles set forth in this report and

--there are no data to show that other programs are complying with these principles.

Thus the executive branch lacks assurance that current user charges are appropriate. While OMB did, at one time, collect data on agencies' user charges, this practice was stopped in April 1974. At this time, there is no systematic collection of user charge information sufficiently detailed to be useful in evaluating agencies' charging policies. This lack of information, coupled with evidence that problems exist in some programs, leads us to believe that a Government-wide review would be useful.

#### PAST USE OF CHARGES

The existence of Federal Government activities financed to one extent or another by user charges is by no means new. One of these, the postal service, began in the late 18th century. Until 1820 this program generated net revenues, but since then it has generally run at a loss, except for the World War I and II periods and a few other years.

The sale of publicly owned land was another source of net revenues for the Federal Government during the first half of the 19th century. The costs involved in the sale of this land were minor compared with the prices people were willing to pay for it. Revenues collected accounted for about 40 percent of total Government revenues (taxes plus charges) in 1835. 1/ Since then the importance of user charges in total receipts has declined, particularly since the introduction of the corporate income tax (1909) and the personal income tax (1913).

At present, user charges account for about 3.2 percent of total Federal revenues. Total user charge receipts are about \$12.8 billion annually, divided as follows:

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1/GAO estimate from Department of the Treasury data.

Federal User Charge Receipts, Fiscal Year 1978 <sup>1/</sup>

	(millions)
Permits and licenses	\$ 283
Rents and royalties	2,573
Sale of products	1,256
Earmarked excise taxes	8,231
Miscellaneous fees and charges	453

Revenues from permits and licenses include immigration, passport, and consular fees and registration and filing fees. Rents and royalties include revenues from the sale of real property, rents and bonuses from land, and rents and royalties on Outer Continental Shelf lands. Revenues from the sale of products come from the sale of agricultural products, minerals and mineral products, electric power, and other products and byproducts. Earmarked excise tax revenues include those deposited in the highway trust fund and the airport and airway trust fund. Finally miscellaneous fees and charges include those for administrative and professional services, communication and transportation services, and legal and judicial services.

LEGAL BASIS OF CHARGES

Enabling legislation

Some current user charges are based on laws authorizing the charges, either directly or through executive agencies. For example, the Taylor Grazing Act (42 U.S.C. 315m), enacted on June 28, 1934, authorizes the Secretary of the Interior to lease lands for grazing purposes "\* \* \* upon such terms and conditions as the Secretary may prescribe." The National Forest Management Act of 1976 (16 U.S.C. 472a) authorizes the Secretary of Agriculture to sell "at not less than appraised value" trees or forest products on lands within the National Forest System. The Outer Continental Shelf Lands Act (43 U.S.C. 1337) authorizes the Secretary of the Interior:

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<sup>1/</sup>See appendix I in this report.

"\* \* \* to grant to the highest responsible qualified bidder by competitive bidding under regulations promulgated in advance, oil and gas leases on submerged lands of the Outer Continental Shelf\*\*\*"

Finally the excise taxes imposed on gasoline and other motor vehicle products and used to finance interstate highway construction and maintenance are established by direct acts of Congress. 1/

#### Broad-based authority

In 1952 the Congress enacted title V of the Independent Offices Appropriation Act (31 U.S.C. 483a), which authorized agencies to impose fees for certain goods and services. While this act, commonly known as the User Charge Statute, has broad applicability in the sense that the goods and services covered are not specified, it is limited in scope since it is not applicable when an agency has other specific statutory authority to impose charges.

#### Legal limitations

A series of recent court decisions has limited the authority of agencies to assess fees. Although these decisions arose under the User Charge Statute, the courts' reasoning appears to apply to any statute permitting an agency to assess fees.

The decisions arose from attempts by the Federal Communications Commission (FCC) to impose annual fees on cable television systems and by the Federal Power Commission (FPC) to charge annual fees to electric and gas companies. In companion decisions the U.S. Supreme Court struck down both these charges.

In the first decision, National Cable Television Association, Inc. v. United States, 2/ the Court distinguished between fees, which the Congress may authorize an agency to assess, and taxes, which only the Congress may assess. A fee is a charge an agency may exact in exchange for a benefit which is not shared by the public.

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1/See, for example, the Highway Revenue Act of 1956, ch. 462, 70 Stat. 387.

2/415 U.S. 336 (1974).

The agency may charge no more than the value to the recipient. It may not charge the recipient for costs attributable to benefits to the public. A tax, on the other hand, need not be related to any specific benefit, and the Congress is not limited to the value of any benefit in setting the tax rate.

In the second case, Federal Power Commission v. New England Power Company, 1/ the Court ruled that a fee may be charged only to specific identifiable recipients of a special Government benefit. An agency may not charge all the members of a group or an industry it regulates, regardless of whether each member actually benefits.

In subsequent challenges to the FCC fee schedule, the United States Court of Appeals for the District of Columbia Circuit further refined the standards to be applied by an agency in assessing fees. In National Cable TV Association, Inc. v. FCC 2/ and Electronic Industries Association v. FCC, 3/ the court ruled that an agency may include in its fees only those direct and indirect costs it incurs in conferring a special benefit on the recipient. It may not charge the recipient for expenses incurred in serving an independent public purpose. Further the agency may not calculate its fees on the basis of the return on investment or profit to be derived by the recipient as a result of the benefit. If such factors are included, the agency is unlawfully attempting to levy a tax rather than charging a fee.

Because of the limits imposed by these decisions, when it is desirable for policy reasons to set a charge which exceeds the cost to the Government of providing a benefit, the charge must be imposed directly by the Congress.

### SCOPE

The substance of this report consists mainly of pricing principles commonly accepted in the economics literature. We extensively reviewed this literature and applied those principles which we found to be appropriate to a number of Federal programs (e.g., irrigation, pollution regulation, and regulation of the broadcast spectrum). In doing so, we discussed pricing practices and principles with either

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1/415 U.S. 345 (1974).

2/554 F.2d 1094 (D.C. Cir. 1976).

3/554 F.2d 1109 (D.C. Cir. 1976).

individuals in the agencies responsible for these programs or experts in independent organizations who have studied them.

We also extensively reviewed the legal problems associated with user charge policies. This review consisted of our analyzing relevant cases, as well as discussing them with attorneys in a number of agencies. We also reviewed a number of statutes authorizing user charges in particular instances.

Finally, we examined Treasury statements that detail Federal user charge receipts over the past 2 centuries. These data were used to review the history of user charge policies and to present the current scope of Federal user charge receipts.

## CHAPTER 2

### THE PROS AND CONS OF USER CHARGES

User charges for publicly provided goods and services are, in principle, desirable for several reasons. They are equitable because they place the cost burden of publicly produced goods and services on the recipients. They also act as a market test for costly products, which ensures that products are not made whose costs exceed their benefits. User charges are also a source of revenue that can lighten the burden on taxpayers. Finally, pricing products provided by the Government contributes to a more efficient allocation of these products, as well as the productive resources shared by the public and private sectors.

There are also arguments against imposing user charges. First, charges may be viewed as inequitable since individuals with lower incomes may be denied equal access to the goods and services sold by Government. Second, some publicly provided goods and services, such as education which, while benefiting identifiable individuals, are considered desirable from the standpoint of society as a whole. Third, those who own assets with values that have been inflated by the past nonimposition of charges suffer capital losses if charges are introduced. Fourth, the administrative costs of charging may be prohibitive. These pros and cons are considered in more detail in this chapter. Of particular importance is the conflict between the issues of equity and efficiency that must often be addressed in public pricing decisions.

#### EQUITY ISSUES

##### Equitable distribution of burdens

An argument in favor of user charges is that individuals in similar circumstances should be treated similarly by the Government. This implies that those who receive special benefits from Government actions should finance their costs. An exception occurs when the bestowal of special benefits fulfills some public purpose, as is the case with veterans and welfare benefits, education, public health, etc. Requiring full payment by recipients would be contrary to the purposes of these programs.

Requiring recipients to pay for publicly provided goods and services ensures that the net impact of Government activity on these individuals will be the same as that on similarly circumstanced individuals who do not receive special benefits. It also avoids the possibility of imposing even greater inequities on these latter individuals, which could

happen if it were necessary to tax them in order to finance the special benefits conferred on others.

While it is reasonable that recipients of publicly provided benefits should bear their costs, two equity arguments oppose such a policy.

#### Unequal income distribution

It can be argued that the pricing of publicly provided benefits is inequitable, because consumers with higher incomes have more bidding power than others and thus, while having needs equal to those of the less well to do, can better afford the benefits. While there is merit to this argument, it is not clear that reducing or eliminating user charges is the solution to this problem.

Underpricing would not eliminate the inequity because publicly provided goods and services might be more intensively used by the relatively rich. Furthermore, reducing charges to subsidize the poor would result in subsidizing the relatively rich as well, unless it would be technically and legally possible to separate consumers by income classes and charge different prices.

Subsidizing those with higher incomes by reducing charges to all consumers is contrary to the equity goals of a price reduction. This is particularly true since subsidies must be financed by general tax revenues. This imposes greater burdens on all taxpayers, including those with lower incomes. The perverse inequity of this result becomes more severe the greater the total subsidy and the larger the proportion of the subsidy that accrues to those with higher incomes.

#### Asset values

The Government's present practice of undercharging or not charging at all for some valuable products that it transfers to beneficiaries increases the value of certain assets. For example, the value of property on a flood plain is higher in the presence of a flood control project than in its absence. Without such a project, land in many riverine areas is worth much less for residential living, conducting business, or agricultural activity. When a flood control project is constructed and beneficiaries do not pay for the protection it affords, the value of the protection is capitalized into the price of land on the protected flood plain. If the Government's policy suddenly changed to one of charging for such a project, surrounding land values would fall by an amount equal to the present discounted value of the future stream of benefits eliminated by imposing a user charge. Present

landowners would suffer losses and these losses would constitute a major source of opposition against imposing user charges.

These losses would be neutral for landowners who enjoyed the original increase in land values when the project was first built or even planned. In these cases the net impact on them of the Government's pricing actions would be zero. However, this probably would not be the usual situation.

The capitalization into land values of expected future protection benefits from free use of the project likely occurred before the present residents obtained ownership. Consequently, the prices they paid for their land included this increased value. To eliminate this value by instituting a user charge as reimbursement for the protection afforded against financial losses would not treat such present owners neutrally, but rather would impose capital losses on them. 1/

The total value of capital losses created by a general application of efficient user charges could be quite large. However, adopting such a policy would not necessarily be inequitable or unfair. The past transfer of capitalized benefits to previous asset owners is just that--past. The relevant equity consideration involves only present asset owners and present and future taxpayers. Maintaining the status quo would avoid imposing losses on present owners only by virtue of the fact that it would impose equivalent costs on taxpayers. Instituting user charges would do just the reverse. Neither group is, in principle, any more deserving of protection than the other.

Adopting a system of user chargers would impose large individual losses on present asset owners, who are fewer in number than the present and future taxpayers who would benefit from such a policy change. The loss suffered by each individual in the latter group would be correspondingly small. For this reason the political pressure against

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1/The charge could be levied in several ways, but the most reasonable way might be through payment of annual premiums equal to the difference between an actuarially determined expected value of financial loss with and without the flood control project. In a sense, such an arrangement would be the same as offering Federal insurance against flood losses on unprotected flood plains. Also this pricing scheme would apply only to new projects. It would not be desirable to recover capital costs that had already been expended.

adopting user charges would likely be greater than that in favor of it. An impartial arbiter would possibly decide in favor of user charges on efficiency and other equity grounds, arguing that the gains and losses of both groups just balanced off. On the other hand, a different arbiter might feel that creation of a small number of large losses would be more onerous than creation of a large number of small ones. The position taken would be obviously a value judgment and could only be politically determined.

USER CHARGES AS A MARKET TEST--  
THE CASE OF IRRIGATION

Products made in the private sector must pass a simple market test--the prices consumers are willing to pay for them must at least equal the costs incurred by businesses in making them. Products not worth their costs are eventually removed from the market. This is not necessarily the case with goods produced and services provided by the Government. Some products that have direct beneficiaries are shielded from a market test through Government subsidy. Cost-benefit analysis is often used to determine whether such products are worth making. Unfortunately, whether these products would survive a market test is not always clear.

A case in point is water provided by Federal irrigation projects. Federal reclamation statutes require that users pay the total costs allocated to irrigation within 50 years, but with no interest. In addition, when irrigation is one part of a multipurpose project, surplus revenues from the sale of electric power and municipal and industrial water may be applied to the costs of irrigation. These practices result in a subsidy provided users of irrigation water. They have, apparently, also contributed to provision of a product whose benefits often fall short of production costs.

The Federal agency primarily responsible for constructing irrigation projects is the Water and Power Resources Service (formerly the Bureau of Reclamation) within the Interior Department. An interagency task force on water policy, which included Interior, has stated that, "Strict compliance of 100-percent repayment by irrigators and other direct beneficiaries would eliminate all but about 10 percent of irrigation as a water purpose in the Reclamation and the SCS P.L. 566 programs." <sup>1/</sup> The fact that benefits

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1/Report on Cost Sharing for Water Resources Investments,  
August 1973, p. 33, unpublished.

from irrigation projects so frequently fall short of costs indicates that something is wrong with cost-benefit analysis in this area. 1/

There are three possible explanations for a finding of positive net benefits when none in fact exist. First, the cost allocation procedures for multipurpose projects may attribute inappropriately low costs to irrigation. Second, the benefits that users are said to derive may be overestimated. Third, irrigation water may create benefits for people other than the direct users of that water or consumers of the crops grown on irrigated land. If they exist, these benefits should rightly be included in cost-benefit analysis, but would not be reflected in the prices that users would be willing to pay for irrigation water. However, it is unlikely that such external benefits are significant, if they exist at all.

Charging water users a fee to recover the full cost of future irrigation would facilitate arriving at efficient investment decisions for irrigation projects, since this would automatically force a comparison between benefits and costs. Charging a fee for irrigation water that reflected the opportunity cost of the resources used to provide it and building projects only when users were willing to pay such a fee would lead to the same efficient investment decisions as would accurate, unbiased cost-benefit analysis. Given the magnitude of the resources devoted to irrigation (\$276 million in

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1/See: Steve H. Hanke and Richard A. Walker, "Benefit-Cost Analysis Reconsidered: An Evaluation of the Mid-State Project," Water Resources Research, vol. 10, no. 5 (Oct. 1974), pp. 898 to 908; Thomas M. Power, An Economic Analysis of the Central Arizona Project: U.S. Bureau of Reclamation (Phoenix, Ariz., CAP Publications, 1978); Thomas A. Power, An Economic Analysis of the Bonnevile Unit of the Central Utah Project: Bureau of Reclamation (manuscript, Economics Department, University of Montana, 1978); John W. Duffield, Economic Critique of the Auburn-Folsom South Unit Central Valley Project (manuscript, Department of Economics, University of Montana, Mar. 17, 1978); Thomas M. Power, An Economic Analysis of the O'Neill Project: Bureau of Reclamation, Nebraska (manuscript, Economics Department, University of Montana, May 1978); Robert J. Barbera and Phil Carver, with Robert K. Davis, The Oahe Unit: An Economic Re-Evaluation (submitted as testimony in litigation on the Oahe Unit, United Family Farmers v. Morton, available from the Oahe Conservancy Sub-District).

fiscal year 1977 1/) this approach could result in substantial resource savings to the economy. Forcing users to behave efficiently would likely decrease their demand for water, with the result that fewer and smaller irrigation projects would be needed in the future.

"The U.S. Bureau of Reclamation, which provides some 8.5 million acres with full or supplemental water supplies, should consider pricing as a means of encouraging better use of water. Under present practice, the Bureau enters into long-term contracts for water deliveries at prices based on estimates of irrigators' ability to pay. The central objective of the Federal reclamation program has been the promotion of irrigation based agricultural communities, not the efficient use of water. This policy is reflected in the ability-to-pay criterion for the pricing of water to irrigation districts. There is substantial potential for more efficient use of Bureau-supplied water through a shift to a cost-based pricing approach, at least on new irrigation projects." 2/

#### USER CHARGES AS A SOURCE OF REVENUE

Imposing user charges on publicly provided goods and services is a source of revenue that the Federal Government could use in lieu of general tax revenues. This does not imply that the Government should either exercise monopoly power and charge inefficiently high prices for its products and services, 3/ or that it should sanction the exercise of monopoly power in the private sector and siphon off the profits gained thereby. Rather, significant revenues could accrue to the Government simply through applying the efficient pricing policies outlined in this report. (See chs. 3 and 4.) For example, a number of estimates have been

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1/Bureau of Reclamation.

2/National Water Commission, Water Policies for the Future (Washington, D.C., Government Printing Office, 1973), p. 257.

3/This may be legally done only by the Congress. Since fees are constrained to recover no more than total costs, monopoly profits arising in fee situations can only be appropriated by use of a tax.

made of the value of the frequency spectrum to broadcasters. One such study arrived at \$414.5 million as the value of the spectrum's use during 1975 to the 492 vhf stations using it. 1/ If some of this were collected by the Government through charging for use of the spectrum by broadcasters, tax collections could be reduced by an equivalent amount.

If the Federal Government wished to increase its revenues from vhf stations to a point somewhere between what it costs to issue licenses and the value of the spectrum, the Congress might have to levy a uniform tax on broadcasters. It is not clear that the Federal Government owns the spectrum, but only the right to regulate it.

#### EFFICIENCY OF USER CHARGES

The concept of efficiency rests on recognition of alternatives and opportunity cost. The opportunity cost of purchasing anything is the value of the purchasing power in its next best alternative use. The opportunity cost of producing a kilowatt-hour of hydroelectric power is the value of the products that could be produced with the same resources. The opportunity cost of allowing one broadcaster to use the limited spectrum is the value others place on its use.

When resources are in limited supply (as they always are), they must somehow be allocated among competing users. In theory, a system of markets and prices performs this allocation efficiently since those who place a higher value on something will be able to bid it away from those who value it less. 2/ For example, resources should flow into the production of hydroelectric power only to the point where the value of an incremental unit of electricity, measured by the price people are willing to pay for it, equals the opportunity cost of

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1/Douglas W. Webbink, "The Value of the Frequency Spectrum Allocated to Specific Uses," IEEE Transactions on Electromagnetic Compatibility, vol. EMC-19, no. 3 (Aug. 1977), pp. 343-351.

2/Also those who have more resources may also be better able to afford it. Those with more resources who choose to use a product or service no doubt value it highly. However, those with few resources may value it just as highly but not be able to afford it. We have not ignored this issue. In fact, we have noted that this is one argument against user charges. But we have also noted that underpricing of the good or service to all is also inequitable since the rich are also subsidized.

producing it. Beyond that point, price is less than opportunity cost, resources are more highly valued elsewhere, and consequently they will be bid away from production of additional hydroelectric power. This efficient diversion of resources requires that the users of the incremental unit of electricity pay for the costs of producing it. The cost of this incremental unit is commonly referred to as incremental cost. 1/

Users will continue to increase their consumption of power so long as the price they have to pay for an additional unit is no greater than the value of that unit to them. If the Government, in providing electricity, absorbs part of the cost of additional units, then the price users have to pay will be correspondingly less, inducing an increase in consumption. This will cause additional resources to be used in producing power. Consumption and production of electricity will increase until the now subsidized price is just equal to the value placed on the last unit consumed. Since the value of this additional consumption is less than the cost of the resources used to produce it, these resources are being employed inefficiently. By lowering the price to users below the opportunity cost of their consumption, the Government helps them bid resources away from alternative employments where they are more highly valued. The efficient allocation of society's scarce resources requires that all prices, including those for products provided by the Government, at least equal opportunity costs, unless overriding social considerations call for a lower price. 2/

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1/In chapter 3 it is argued that prices equal to incremental costs are not always efficient and that consequently prices equal to average total cost are often desirable. In addition, when fees are based on incremental costs, the total revenues collected cannot exceed the costs incurred in producing the good or service. If efficient incremental cost pricing would require a higher price, some type of tax would have to be imposed by the Congress.

2/In fee situations, "opportunity cost" refers to the costs of the resources used to produce a good or service. An agency may legally charge a fee that reflects opportunity cost so long as it does not yield revenues exceeding total production costs. A higher price would require a tax. (See note 1 above.) With sales and leases, opportunity cost equals fair market value. Agencies may legally charge on the basis of opportunity cost in these situations, when authorized by statute.

## COSTS OF CHARGING

To charge for a publicly provided good or service generally is not desirable if the administrative costs of doing so exceed expected receipts. Collection costs may be high in some cases, particularly when excluding nonpaying users is physically difficult. This problem can, in some cases, be circumvented by using indirect charges, which are discussed more fully in the following chapter.

## CHAPTER 3

### CHARGES FOR GOODS PRODUCED AND SERVICES PROVIDED AT PUBLIC EXPENSE

Charges for goods and services provided at public expense should, in general, be designed to recover present and future total production costs of providing independent benefits. <sup>1/</sup> However, incremental costs should be recognized, and charges or taxes reflecting incremental cost should be levied when possible. Incremental costs that vary with usage should also be recognized. Adjustments to total cost recovery should be made when external costs or benefits are present or when attaining social goals other than economic efficiency requires price adjustments. Finally, when direct pricing is impractical, indirect approaches, such as earmarked excise taxes, can be used.

#### LIMITATIONS TO INCREMENTAL COST PRICING

##### Problems

Setting charges equal to the incremental cost of producing a good or service is not always possible or desirable. It is not always possible because measuring incremental cost is often difficult. <sup>2/</sup> It is not desirable when the revenues generated by incremental cost pricing do not cover total production costs. This will occur when costs that do not vary with the level of output (fixed costs) constitute a large proportion of total costs. Measurement difficulty is both the more common problem and the more readily appreciated. The latter problem warrants a more detailed explanation.

The cost to the Government of producing an incremental unit of electricity does not include (1) any of the capital costs incurred in building a dam, (2) all the costs of maintaining the dam and its equipment, or (3) administrative costs of the responsible public agency. The opportunity cost of producing an incremental unit of electricity is low relative to these costs. The efficient use of existing hydroelectric facilities requires that the fee charged for electricity be correspondingly low.

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<sup>1/</sup>By total cost recovery we mean costs of providing an independent benefit.

<sup>2/</sup>The legal problems of incremental cost pricing in fee situations have already been discussed in note 1, p. 17.

Such incremental cost pricing would not be efficient, however, if new facilities were constructed to meet the demand for electricity existing at this low fee. If incremental cost pricing were maintained, total revenues collected for the electricity produced by the new facilities would likely be less than the cost of the resources used to construct them. The market value of the electricity produced would be less than its opportunity cost. The result is the same as when the Government subsidizes the consumption of some good or service; resources are diverted from more highly valued activities. Incremental cost pricing can, over the long run, lead to an inefficient allocation of resources.

#### Possible solutions

There is no ready solution to the measurement problem. Usually the best that can be done is to charge a fee equal to average total cost, which is easily measured. However, if incremental costs are measurable, but they are low relative to fixed costs, there are other pricing alternatives.

One approach is a two-part tariff, under which users are assessed a charge unrelated to use to cover fixed costs and a charge equal to incremental cost to cover the rest. Electricity consumers, for example, may be assessed a flat annual charge plus a charge based on consumption. Such a pricing policy requires that users purchase the good or service over some period of time and that they can be prevented from consuming the good if they do not pay the fixed charge. While this may be the case with electricity consumers, it is not so, for example, with those who purchase publications from the Government Printing Office. Note also that while this pricing technique may be beneficial on economic grounds, legal considerations may exist that would restrict its full implementation.

Another approach is to vary price with usage. For example, all consumers can be charged the same price for a certain number of units of a good consumed during some time period. If any consumers want more units during the same period, they can be charged a different (probably lower) price for these additional units. A third group of units, with yet a third price per unit, can be established, and so on. As many groups, each with their own price per unit, can be established as is administratively feasible and desirable. The objective of this pricing approach is to increase consumption to the point where the price associated with some group of units just equals the incremental cost of producing all units. When fixed costs are a large portion of total cost, this pricing method allows consumption to increase to

the point where price equals incremental cost while covering total costs.

While it is generally inefficient to charge a price greater than incremental cost for a good produced or a service provided with existing facilities, in some instances a higher price may be justified. An existing facility that cannot be easily expanded may make a product for which the demand at a price equal to incremental cost exceeds the quantity that can be made. A higher price is warranted in such a case. For example, a dam producing hydroelectric power should allocate the electricity among competing potential users by charging a price set by them. This price may exceed incremental costs. In fact, it may even exceed the total costs originally incurred in building the dam. Nevertheless, it is economically efficient to allocate the supply by charging a higher price, rather than rationing it among potential users. Of course, if other social policy goals require certain users to be allocated some portion of the supply at a price below what other potential users are willing to pay, then this should be done. Many public policy goals take precedence over the goal of economic efficiency.

#### CAPACITY LIMITS AND VARIATIONS IN INCREMENTAL COST

Not all costs associated with some goods and services are incurred during production and delivery. Some costs are created in consumption of a good or use of a service. One example is the congestion occurring when the physical capacity of a river lock is exceeded during busy periods. The incremental cost of an additional barge's use of the lock is much greater when traffic is heavy than it is during offpeak hours. The social cost of lock usage is higher during peak periods. Peak load pricing could minimize this social cost.

Since incremental cost varies with use, the efficient user charge should vary similarly. For example, total costs could be collected by imposing a surcharge during peak periods and a discount during nonpeak periods. Such pricing would induce some users to switch their use from rush hours to times when the charge was less. The peak load would be correspondingly reduced. This spreading out of demand would reduce the costs of delay created by congestion. In addition, there would be less need for increasing the capacity of the facility--an additional resource saving for society.

As is the case with a few of the pricing practices suggested in this report, a note of caution is required regarding peak load pricing. While this technique would be beneficial

on economic grounds, legal considerations might restrict its full implementation. 1/

#### EXTERNAL COSTS AND BENEFITS

A measurement problem occurs when provision of a good or service involves externalities, costs, and benefits that affect third parties not directly involved in an exchange. Effluents generated in producing a good are external costs. An external benefit is exemplified by an individual's receiving an inoculation. It not only benefits the recipient, but also others to the extent that the recipient is less likely to spread the disease.

The pricing problem created by externalities is that it is often difficult to derive their value. As a result, how much market prices should be adjusted to reflect their presence is not clear. The direction of change is clear--price should be reduced when external benefits exist, while it should be increased in the face of external costs. 2/ The difficult, and likely unanswerable, question is: How much of an adjustment should be made? This is often answered by judgment rather than precise calculation.

#### IMPLEMENTATION PROBLEM

It is sometimes difficult to impose direct charges on the users of publicly provided goods and services. For example, to exclude nonpayers from consuming the goods or services may be physically impossible. Such is the case with national defense. In other instances preventing the enjoyment of the good or service by nonpayers may simply be prohibitively expensive. Or, what amounts to the same thing,

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1/Peak load pricing may legally require some combination of fees and taxes since the total revenues collected may exceed total costs to the Government. This is largely due to the fact that some costs reflected in a peak load price are costs of delay that users impose on each other and have nothing to do with the costs incurred by the Government in making a facility available to users.

2/Again, a tax may be necessary for price to reflect external costs, since these costs are unrelated to costs incurred by the Government. However, external costs can also be dealt with by sales or leases, which allows agencies to impose the appropriate user charge themselves, when so authorized by the Congress. This approach is discussed in the next chapter.

significant cost savings may result from using other than direct charges. This is the case with interstate highways.

When implementing a system of direct charges is impossible or expensive, there are alternative financing mechanisms which, unlike taxes used to finance national defense, can at least roughly equate charges with benefits. These alternatives take the form of "benefit taxes," and are commonly applied to privately made products used in conjunction with the publicly provided goods or services for which charges are being imposed. For example, the earmarked excise taxes applied to fuels used by automobiles, airplanes, and barges are intended to finance, to one extent or another, the construction, operation, and maintenance of highways, airports, and inland waterways, respectively.

## CHAPTER 4

### CHARGES FOR NONPRODUCED GOODS

Some goods are not produced by the Federal Government, but are nonetheless publicly owned or regulated. The characteristic common to all is that their supply is in some way limited. The Government may incur incidental costs in making additional units available to users (costs of issuing licenses and permits, for example), but it cannot increase the supply of these goods by adding more resources to some production process. At the maximum supply available, the price users are willing to pay for the last unit of the good typically exceeds the incremental cost to the Government of making it available. Consequently, the economically efficient user charge usually exceeds this incremental cost since the relevant opportunity cost associated with the incremental unit is the value placed on it by alternative users, not the cost to the Government of providing it. In these cases "user charge" refers to the price that the Government receives from selling or leasing the good.

The charge for a nonproduced good should equate use with supply. Price should just clear the market. There may exist situations, however, when the market-clearing price is lowered by the collusive action of a small number of buyers. In such cases the agency marketing a nonproduced good should use available appraisal techniques to determine fair market value. When the buyers are themselves manufacturers that use the publicly provided good to make some product (e.g., offshore oil, the broadcast spectrum), fair market value can be estimated from the rate of return these producers earn on the publicly provided good.

As with goods and services produced at Government expense, the price of nonproduced goods should be adjusted when social goals other than economic efficiency take precedence. Prices above or below fair market value are warranted when they permit attainment of overriding social objectives.

#### NATURALLY LIMITED SUPPLY

Offshore oil-drilling rights, timber grown on Federal lands, and grazing rights on federally owned lands are examples of goods marketed, but not produced, by the Government. <sup>1/</sup> The charges associated with these goods are not based on the

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<sup>1/</sup>See 43 U.S.C. 1337, 16 U.S.C. 472a, and 43 U.S.C. 315m.