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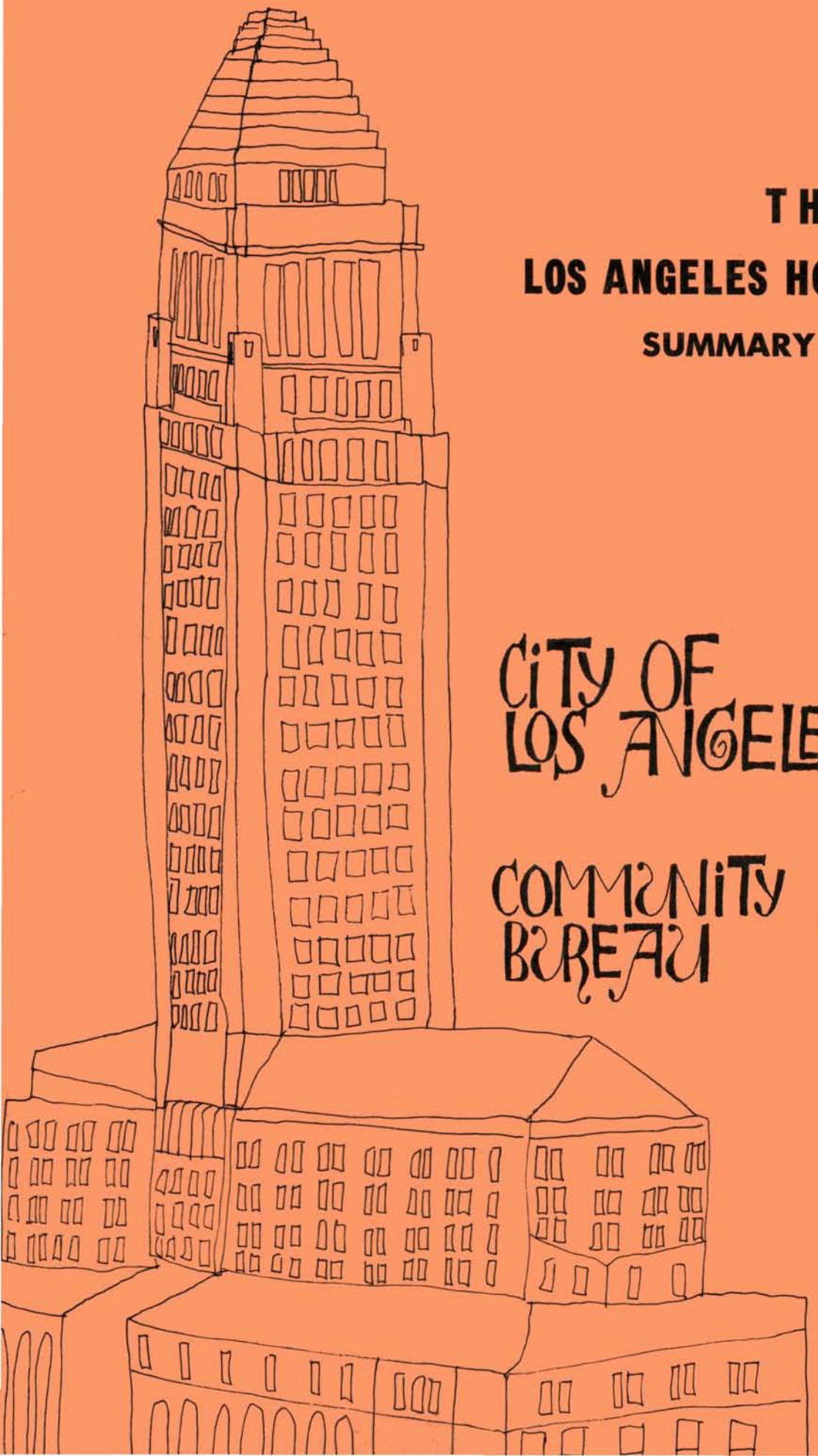

THE
LOS ANGELES HOUSING MODEL
SUMMARY REPORT

CITY OF
LOS ANGELES

COMMUNITY ANALYSIS
BUREAU

LOS ANGELES HOUSING MODEL

The Summary Report

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July, 1974

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FOREWORD

This summary of the larger document called "The Los Angeles Housing Model - The Technical Report" is intended to acquaint the general public with a project of significant importance to Los Angeles and other communities in the United States. The product is transferable in its present form. Other data bases were contemplated to enlarge the present data base; but the present data base is one that every municipality has available to it. However, that data base will grow stale if not updated with more current information.

HUD is to be complimented in funding so basic a research project. It has and will be used on the local level. A letter dated April 2, 1974 from the Mayor, Tom Bradley, and the President of the Council, John S. Gibson, Jr., stated ..."The City is extremely pleased with the work done under the contract because its results have already been of use to decision makers within the City. This HUD contract has achieved the goal of providing tools that allow local elected officials to make informed decisions using the new technology." We feel it is unfortunate that HUD would only fund this project for the single period of time. So much more could have been accomplished if the City of Los Angeles could have been permitted to fully address the question of Housing Policy.

This summary tells what was done and hints at some of the other areas to be addressed. We hope that someone can build on what was done and will keep the City of Los Angeles advised. Until that time the Housing Model as implemented in Los Angeles will continue to do the work it was developed to meet.

ROBERT E. JOYCE
Director
Community Analysis Bureau

TABLE OF CONTENTS

The Los Angeles Housing Model

The Summary Report[1]

INTRODUCTION

Adequate housing is one of the most important areas of concern for the City of Los Angeles. Difficult aspects in resolving this problem are the formulation of equitable and financially reasonable programs of action. Approaches require an understanding of many agencies, the way in which they operate, the funds available, the character and distribution of inadequate housing, the nature of demand, and the interaction with supply. With a Department of Housing and Urban Development (HUD) grant, and City resources, the Los Angeles Community Analysis Bureau undertook the design and development of a housing model and housing information data base to assist local decision-makers in housing policy analysis and program development.

Because a large number of potential policy choices exist for decision-makers, effort was concentrated on the development of a good housing information data base that could respond to a

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[1]The project is documented in the technical report. See, Stanley R. Hoffman, William D. Diemer, Nanci Frederick, and Preston Weng, The Los Angeles Housing Model, The Technical Report (Los Angeles: Community Analysis Bureau, City of Los Angeles, 1974).

broad range of questions; and the development of an elementary, but operational model that could begin to deal with some of the more timely policies.

A modelling framework allows one to test and evaluate ideas or programs before they are implemented. One is able to simulate "real life" without the expense of actually carrying out the project. Hence the housing policy evaluation model, designed for this study, is intended to provide insights into the impacts of various housing policies before actual implementation.

Early in the project, it was recognized that there was an immediate need for accurate housing information and analysis by local agencies and groups. While the housing policy evaluation model was under development, a set of less elaborate estimation models were developed to meet this need and are described in this report.

The housing policy evaluation model has been designed and a version is currently operational. A housing allowance policy has been tested; though the results should be considered tentative, they have implications for a housing allowance program, particularly regarding the size and cost of such a program for Los Angeles County.

PROJECT OBJECTIVES

There were six project objectives:

1) Study, develop, test and apply a set of models to identify Los Angeles' housing needs and potential housing development sites;

2) Determine the advisability of specific housing programs for specific areas, which could respond to the needs of Los Angeles' citizens and would conform to the City's and HUD's housing policies;

3) Demonstrate how an operating municipal information system (e.g., the Community Analysis Bureau's system), similar to the prototypes being developed under the Urban Information Systems Interagency Committee (USAC)[2] can be used to improve significantly a city's assisted housing, planning and development functions; and,

4) Develop a housing model that will be designed to evaluate the desirability of low and moderate income housing programs under various HUD policies;

5) Develop an operational model within a local government to be used by local decision-makers; and,

6) Develop a model which is transferable to other cities and jurisdictions.

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[2]USAC is an interdepartmental committee set up within the Federal government to coordinate and sponsor research and development of integrated municipal information systems at the local level.

PRODUCTS

The principal products of this study are:

1) Housing Problem Analysis

2) Small Area Data Base

3) Housing Policy Evaluation Model

4) Metropolitan Area Data Base

The Housing Problem Analysis focused on three questions:

1) What is the need for adequate housing in Los Angeles?

2) To what extent is the present stock of housing capable of meeting these needs?

3) What proportion of the existing housing stock is of standard quality by contemporary criteria?

The Small Area Data Base provides a rich variety of information from a diverse set of national and local data sources. Using the census tract as the reporting unit, it contains all the data and estimates used in the analyses of housing problems. All of the information developed for these analyses are available by census tract as well as planning areas and councilmanic districts for the City of Los Angeles.

The Housing Policy Evaluation Model is a computer simulation approach which estimates the consequences of implementing a particular housing policy aimed at assisting in solving the County's housing problems. This model evaluates a hypothetical housing allowance program for a variety of target populations

under different program criteria and budget ceilings, and has been designed so that additional policies can later be incorporated.

The Metropolitan Area Data Base, using the household and housing unit as the reporting unit, was designed as an input for the Housing Policy Evaluation Model computer program. It provides great flexibility for specifying particular target populations and policy constraints, but has no locational specificity in its present form.

Housing Problem Analysis

Housing Needs

The evaluation of alternative housing policies and programs designed to meet housing needs begins with an identification of those needs:

1) Physical need--households living in units lacking complete plumbing facilities (hot running water, private tub or shower, private flush toilet).

2) Space need--households living in crowded units with fewer rooms than persons (persons per room ratio 1.01 or more)

3) Economic need--households paying an excessive proportion (25 percent or more) of their gross income for rent and utilities.

The number of renter households in Los Angeles County estimated to be in need is so large, according to the above criteria, that high-priority needs were defined:

4) Severe crowding--1.51 or more persons per room

5) Severe economic need--households paying 35 percent or more of their gross income for rent and utilities.

Housing Gap

A process of matching households by size and income with housing units by rent and number of rooms was devised to identify the types of units that might be required to house the population adequately. Deficiencies between needs and supply, represented by households that cannot be matched to adequate units, constitute the "housing gap".

The housing gap analysis was performed for each census tract within the County under the following matching criteria:

1) No household shall be matched to a unit if it is too costly (i.e., rent/income ratio greater than 25 percent); and,

2) No household shall be matched to a unit if it will result in overcrowding (i.e., persons per room ratio greater than one).

The matching is performed for owner and renter occupied units added together. Vacant units are also included.

The gap estimate is derived by the hypothetical process whereby all households could potentially be matched to all units if they were judged "adequate". Essentially, this hypothetical process "rearranged" households among the units under the criteria specified. These criteria have generally been applied under Federal housing programs in the past.

Housing/Environmental Quality

The development of effective housing policies and programs is largely dependent upon accurate knowledge concerning the condition of housing structures and the surrounding environment. Appropriate policies can then be established for alleviating problems relating to both the physical condition of the housing and other neighborhood deficiencies. Through utilization of reliable housing and environmental quality measures, attention can be focused on neighborhoods where quality is declining or has dropped below a certain level.

This study has produced a combined measure of housing and environmental quality using three separate data sources:

1) 1970 U.S. Census of Population and Housing,

2) Local housing inspection data, and

3) Color infrared (CIR) aerial photography

Three separate measures of quality were developed independently from these data sources and then combined into a single, composite measure based equally on the three separate measures.

The composite measure of quality that was developed is most reliable as a relative index and least reliable as an exact estimate of the number of unsound units. As a guide to policy making, the measure does appear to be useful for suggesting areas where various types of housing maintenance programs might best be applied.

Small Area Data Base

The Small Area Data Base, which combines household, housing unit, and housing related information, was used with the Housing Problem Analysis. It also provides an organized framework for the collection of future housing data and modelling.

The census tract was selected as the reporting unit for the system and the base includes all tracts within the County of Los Angeles. The organization of the data base is:

1) Driver file

2) 1960--1970 trend data;

3) 1970 base year data; and

4) Annually updated information from 1970.

The Driver File is a thoroughly checked master list of all the census tracts in Los Angeles County. It also includes a number of codes and information which serve a variety of purposes. These codes and information are used to aggregate housing data to larger areas of interest, such as planning areas and councilmanic districts (within Los Angeles) and the City and County of Los Angeles. The X, Y, coordinates allow spatial manipulation of the data base, such as the determination of the accessibility of housing areas to employment and the market areas of housing need.

The 1960--1970 Trend Data enables the analysis of policies and programs for areas in light of changes that have been occurring, such as the rate of new construction and population composition and distribution changes. The data were obtained from the 1960 and 1970 censuses and consideration was given to tracts that were split into two or more tracts since 1960.

The 1970 Base Year Data have been assembled from a wide variety of sources which include: 1970 Census, County Assessors File, Board of Education, Southern California Rapid Transit District, Local Area HUD Subsidized Housing File, Environmental File, and the CAB's municipal information

system.[3] When data were not directly available, estimates were required, e.g., the numbers of substandard units and housing needs estimates.

Housing Policy Evaluation Model

To assist local decision-makers in housing policy analysis, the Housing Policy Evaluation Model has been designed and a version is operational. Its purpose is to forecast the probable consequence, or impacts, of implementing several types of housing policies.

The current version of the model evaluates only various housing allowance schemes, but its design can be expanded to encompass other policies. The housing allowance was chosen because of the strong possibility that this will be one of the significant housing programs of the future, and the desire to make a contribution to the evaluation of this policy.

Early in the project, the basic strategy was adopted. A broad design framework would be established, and an elementary, but operational model would be developed and tested, even at the cost of losing some sophistication. This course was set because of the nature of the operating environment, i.e., the City of Los Angeles versus a research institution, and because this would involve a full cycle of design, development, and testing.

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[3]Community Analysis Bureau, Data Analysis Division, 1973 State of the City Data Base (Los Angeles: Community Analysis Bureau, City of Los Angeles, 1973).

The need for operational models is important because decision-makers must choose among policy alternatives now, and inputs into this process can have significant impacts.

The Housing Policy Evaluation Model generates a set of outputs, or consequences, as a result of policy specifications and program criteria entered into the system. The user prepares a set of inputs for each run which include for the allowance policy, various options such as: eligibility criteria, income limits, participation rate, moving policy, maximum allowable rent and maximum rent/income ratio. The outputs are estimated consequences of implementing the policy program costs; number of participating households (including movers and non-movers); the change in various housing needs indicators; the change in the amount of standard and substandard vacant stock; and the number of households not locatable in suitable units under current input options.

The model was run for the entire County of Los Angeles, with no spatial disaggregation or neighborhood considerations, and with the non-allowance eligible households held in their present units. Also, the supply side was held constant with the total number and rent levels of units remaining fixed. Thus, the results of the model should be considered tentative, and used with caution. The current version of the model will not easily predict the supply side of the market. However, if the model is used to evaluate a program small enough not to impact the supply, it is useful in establishing some upper

limits on annual program costs, potential number of participating households, expected changes in housing needs according to criteria used, and whether an adequate supply of units exists given the number of participating households.

Metropolitan Area Data Base

The Policy Evaluation Model program operates with a data base which is an edited extract of the 1970 Public Use Sample issued by the United States Bureau of the Census. This sample consists of two separate randomly-selected one percent samples of the actual schedules used to collect the information reported in that census. This sample includes one summary record for each selected household, and one for each person in these households. Each derived record in the data base contains data on a single household and housing unit, and may be considered to represent 50 similar households in the County.

The use of Public Use Sample as the data source makes it possible to define policy criteria with as much detail as is deemed desirable, subject only to the limitation of availability of the required parameters in the census schedule itself. Another reason for this choice is transferability. The Public Use Sample is available for every county, or group of counties, having a 1970 population of at least 250,000.

This data base does not provide answers to locational questions. However, Public Use Samples can be obtained, on a custom basis, for areas smaller than an entire county.[4]

Findings

The discussion of findings falls into two parts:

1) Problem Analysis--housing needs, housing gap, and housing/environmental quality estimates; and,

2) Policy Approaches--policy testing with the housing model designed for this study.

The problem analysis begins with the identification of gross housing needs among various population groups. The analysis shows that 52 percent (316,409) of renter households in the City are inadequately housed according to the following three needs criteria:

1) 44 percent are paying excessive rent (greater than 25 percent of gross income);

2) 10 percent are overcrowded (more than one person per room); and,

3) 2 percent live in units lacking complete and adequate plumbing facilities.

Due to the overlaps among the above three groups, 4 percent of the renter households have two or more of these needs. There are 24,775 such renter households in Los Angeles.

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[4]The procedure and product is described in "Public Use Samples for Special Geographic Areas," Small-Area Data Notes, (Washington: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, February 1973), Vol. VIII, No. 2, p.1.

As might be expected, the needs are concentrated among the low-income population, with nearly 80 percent of low-income renter households paying excessive rent, while only 14 percent of the high income group are in this category. The elderly have a higher degree of need than the non-elderly, with the difference most pronounced, again, among the low-income population. Also, the minority populations have higher needs than the non-minority populations.

An important observation is that even some middle and high income households are among those identified as having housing needs, particularly with reference to the overpayment criterion. In part, it suggests that middle and high income groups trade off other goods and services for housing to attain high levels of shelter services and amenities including attractive neighborhoods, proximity to place of work, decreased transport costs, and other opportunities.

To what extent are housing needs, as measured by these criteria, a reflection of housing problems such as inadequacy of supply and substandard quality housing, and to what extent a reflection of other social and economic problems? The fact that rent overpayment is the dominant factor suggests a structure of needs based on source of income and employment. This structure of needs clearly shows that rent payment may be excessive because of under-employment or unemployment or inadequate benefits from Social Security and welfare payments, with sixty-three percent of those paying excessive rent falling into one of these income groups.

Eighty-five percent of Social Security recipients and ninety-two percent of the welfare recipients are paying excessive rent.

A process of matching households by size and income with housing units by rent and number of rooms was devised to identify the types of units that might be required to house the population adequately. Deficiencies between needs and supply, represented by households that cannot be matched to adequate units, constitute the "housing gap."

This housing gap analysis was performed for each census tract within the County under the following matching criteria:

1) No household shall be matched to a unit if it is too costly (i.e., rent/income ratio greater than 25 percent); and,

2) No household shall be matched to a unit if it will result in overcrowding (i.e., persons per room ratio greater than one).

All households could potentially be matched to all units if they were judged "adequate." Essentially, this hypothetical process "rearranged" households among the units under the criteria specified. These criteria are some of the ones generally applied under Federal housing programs.

An analysis of the City on a tract by tract basis resulted in 104,000 unmatched households, that were almost entirely in the low income brackets. They comprise 10.7 percent of all households. The analysis resulted in 135,509 unmatched housing units, with the difference of 31,083 representing the vacant stock. These unmatched units were

either too costly or too small according to the criteria used. Units that were too costly constituted the major excess supply factor. Most of these units were in the middle rent ranges and included units of all sizes. This suggests again, that in Los Angeles, there is not so much a housing problem per se, as there is a housing symptom of an income problem.

An analysis of the housing gap was subsequently made for the entire City to simulate the effect of free movement throughout the City, i.e., the removal of segregation and other barriers to moving across neighborhoods. This was done by allowing households to be matched to units within any census tract in the City, rather than on a tract by tract basis. The locational component of the housing problem is noted by a drop in the number of unmatched households from 104,426 (10.7 percent) to 54,349 (5.6 percent). This is a drop of almost 50 percent. This represents a housing symptom of restrictions to mobility, including segregation.

Substandard quality housing is also part of the housing problem with an estimate for 1970 of 77,190 (7.2 percent) of the 1,074,131 year round housing units rated as substandard. This was a decrease from 1960 when 83,017 (8.9 percent) of the 935,507 year round housing units were rated as substandard. Although the percentage of substandard housing is relatively lower citywide than the needs estimates, it amounts to 25 percent or more of the inventory in some of

the lower income areas. This is particularly true around the central downtown areas.

In developing policy approaches to ameliorating the housing problems that have been identified, the housing policy evaluation model was used.

The effects of a housing allowance were simulated for different target groups, with the low income elderly population given highest priority. The results though still considered tentative, constitute approximate magnitudes of program cost and size for the assumptions mentioned.

The annual estimated program costs in Los Angeles County (allowance payments only) for households in various target groups range from $5.3 million for moderate income elderly households only, to $169.6 million for the combination of low- and moderate-income elderly and non-elderly households at the 75 percent participation rate. At the 25 percent participation rate, the estimates range from $1.8 million to $56.5 million, respectively. These are substantial costs, even at the 25 percent level and represent only one major county. However, the most valid comparison is probably the cost estimates at the 4 percent participation rate which range from $0.3 million for moderate income elderly to $9.1 million for the combination of low- and moderate-income elderly and non-elderly households. The 4 percent rate was chosen because it enables comparison with the San Bernardino, California, Housing Allowance Experiment

where approximately 4 percent of eligible households were enrolled in the program. Also, a program of such a small scale would minimize impacts on the supply.

One of the potential consequences of a housing allowance program is the demand pressures it places on the existing housing supply with significant distinctions between the short run and long run. If a program were implemented, involving a significant participation of eligible households, housing prices in the short run may be expected to rise for the standing stock of housing units. Thus, the potential benefits from the policy could be substantially eroded until suppliers respond to the higher prices by rehabilitation of existing units or building new units. Such responses are more likely in the long run as compared to the short run, but lags could be shortened if rehabilitation and construction policies were also encouraged