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Comisión Económica para América Latina y el Caribe

**BIBLIOTECA NACIONES UNIDAS ESTADOS UNIDOS**

**ISTMO CENTROAMERICANO: ESTADISTICAS DEL SUBSECTOR ELECTRICO**

**(Datos actualizados a 1994)**

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## PRESENTACION

En este documento se presenta actualizada la información técnica sobre el subsector eléctrico del Istmo Centroamericano. Mediante este informe se pretende proporcionar un elemento de consulta confiable para los estudios y análisis que emprendan organismos e instituciones nacionales e internacionales, o bien personas interesadas en el tema.

A fin de facilitar la lectura, los cuadros y gráficos integrados en cada página del documento muestran la evolución de las principales variables por país: capacidad instalada, generación, ventas, pérdidas, intercambio de energía y demanda. Asimismo, se incluye información de especial interés, como la cogeneración, la generación privada de energía eléctrica y el consumo de hidrocarburos en el subsector.

Los datos corresponden a los sistemas nacionales interconectados, salvo en los casos en que una nota explicatoria indique lo contrario. Las cifras de 1994 son preliminares.

La mayor parte de la información utilizada para elaborar este reporte proviene de la Base de Datos de Energía de la Comisión Económica para América Latina y el Caribe (CEPAL). No obstante, su conformación definitiva hubiera sido imposible sin el valioso aporte de los boletines estadísticos y otros importantes datos aportados por las empresas eléctricas nacionales.

Con miras a proseguir la actualización del documento, serán acogidas todas las observaciones y sugerencias formuladas por los lectores.

**ISTMO CENTROAMERICANO: OFERTA/DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA, 1994**

|                    | Demanda      | Potencia instalada (MW) |                |              |              |                | Generación      | Generación neta (GWh) |                 |                |                |                |
|--------------------|--------------|-------------------------|----------------|--------------|--------------|----------------|-----------------|-----------------------|-----------------|----------------|----------------|----------------|
|                    | Máxima (MW)  | Total                   | Hidro          | Geo          | Vapor        | Dies+Gas       | Bruta (GWh)     | Total                 | Hidro           | Geo            | Vapor          | Dies+Gas       |
| <b>Istmo</b>       | <b>3,405</b> | <b>4,840.0</b>          | <b>2,749.7</b> | <b>236.0</b> | <b>569.0</b> | <b>1,291.4</b> | <b>18,382.2</b> | <b>18,095.8</b>       | <b>11,169.3</b> | <b>1,025.0</b> | <b>2,023.0</b> | <b>3,878.5</b> |
| <i>Costa Rica</i>  | 858          | 1,100.7                 | 791.2          | 55.0         | 15.0         | 239.5          | 4,723.5         | 4,689.7               | 3,547.4         | 324.0          | 46.3           | 772.0          |
| <i>El Salvador</i> | 566          | 817.5                   | 388.0          | 105.0        | 63.0         | 261.5          | 3,145.9         | 3,075.3               | 1,441.9         | 373.1          | 364.7          | 895.5          |
| <i>Guatemala</i>   | 624          | 1,030.8                 | 492.1          | -            | 160.5        | 378.2          | 3,256.8         | 3,225.5               | 1,597.8         | -              | 349.3          | 1,278.4        |
| <i>Honduras</i>    | 453          | 590.2                   | 424.2          | -            | -            | 166.0          | 2,281.5         | 2,251.0               | 1,817.3         | -              | -              | 433.8          |
| <i>Nicaragua</i>   | 312          | 390.4                   | 103.4          | 70.0         | 175.0        | 42.0           | 1,625.5         | 1,547.2               | 381.7           | 327.8          | 722.5          | 115.1          |
| <i>Panamá</i>      | 592          | 910.4                   | 550.8          | -            | 155.5        | 204.1          | 3,348.9         | 3,307.0               | 2,383.2         | -              | 540.2          | 363.7          |

|                    | Energía (GWh)           |              |              |                |                 |               | Ventas          | Pérdidas (%) | Factor Carga (%) | Combustible (MBI) |                |              |
|--------------------|-------------------------|--------------|--------------|----------------|-----------------|---------------|-----------------|--------------|------------------|-------------------|----------------|--------------|
|                    | Generación neta pública | Exportación  | Importación  | Compras        | Disponible      | Racionamiento |                 |              |                  | Búnker            | Diesel         | Otros a/     |
| <b>Istmo</b>       | <b>17,004.0</b>         | <b>233.7</b> | <b>239.7</b> | <b>1,244.9</b> | <b>18,254.9</b> | <b>570.8</b>  | <b>14,945.8</b> | <b>18.1</b>  | <b>61.2</b>      | <b>5,491.9</b>    | <b>6,181.7</b> | <b>453.2</b> |
| <i>Costa Rica</i>  | 4,646.7                 | 6.4          | 0.0          | 43.0           | 4,683.3         | 0.0           | 4,208.6         | 10.1         | 62.3             | 211.0             | 1,590.0        |              |
| <i>El Salvador</i> | 3,075.3                 | 43.3         | 32.0         | -              | 3,064.0         | 21.6          | 2,590.7         | 15.4         | 61.8             | 813.2             | 1,945.2        |              |
| <i>Guatemala</i>   | 2,301.1                 | 30.8         | 42.0         | 924.4          | 3,236.7         | 9.0           | 2,769.8         | 14.4         | 59.2             | 1,772.1           | 988.0          | 444.4        |
| <i>Honduras</i>    | 2,133.0                 | 6.2          | 61.9         | 118.0          | 2,306.7         | 424.4         | 1,652.0         | 28.4         | 58.1             | 181.0             | 539.8          | 8.8          |
| <i>Nicaragua</i>   | 1,540.9                 | 65.9         | 46.5         | 6.3            | 1,527.8         | 115.8         | 1,089.1         | 28.7         | 55.9             | 1,349.4           | 261.6          |              |
| <i>Panamá</i>      | 3,307.0                 | 81.1         | 57.4         | 153.1          | 3,436.5         | -             | 2,635.7         | 23.3         | 66.3             | 1,165.2           | 857.1          |              |

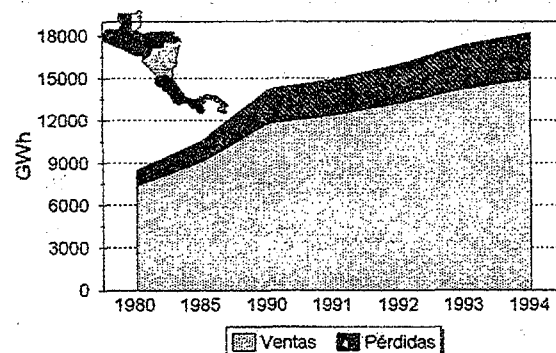
Fuente: CEPAL, sobre la base de cifras preliminares proporcionadas por las empresas eléctricas de los países.  
a/ Corresponde a petróleo crudo para Guatemala y diesel marino para Honduras.



## ISTMO CENTROAMERICANO: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             |               | %       |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|---------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas  | Pérdidas | Factor de carga |
| 1980 | 2420.7              | 1584           | 8466.7                  | 29.5        | 29.5        | 5.5     | 8472.2      | n.d.          | 7397.3  | 12.7     | 61.1            |
| 1985 | 3923.4              | 1988           | 10562.3                 | 205.9       | 204.2       | 35.3    | 10596.0     | n.d.          | 9138.5  | 13.8     | 60.8            |
| 1990 | 4121.3              | 2614           | 14175.2                 | 421.5       | 399.5       | 83.9    | 14237.2     | n.d.          | 11813.4 | 17.0     | 62.2            |
| 1991 | 4279.3              | 2798           | 14820.4                 | 327.2       | 312.3       | 106.7   | 14912.3     | 232.9         | 12353.3 | 17.2     | 60.8            |
| 1992 | 4466.9              | 3014           | 15786.7                 | 259.3       | 256.4       | 205.6   | 15989.5     | 63.4          | 13236.3 | 17.2     | 60.6            |
| 1993 | 4679.8              | 3207           | 16556.8                 | 198.6       | 197.7       | 806.2   | 17362.0     | 42.3          | 14256.5 | 17.9     | 61.8            |
| 1994 | 4840.0              | 3405           | 17004.0                 | 233.7       | 239.7       | 1244.9  | 18254.9     | 570.8         | 14945.8 | 18.1     | 61.2            |

DISTRIBUCION DE LA ENERGIA DISPONIBLE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

La demanda máxima es no coincidente y representa la suma de las demandas máximas en los países.

Las columnas de importación y exportación corresponden a intercambios de energía entre países.

Las compras corresponden a transacciones internas en el país con otras empresas.

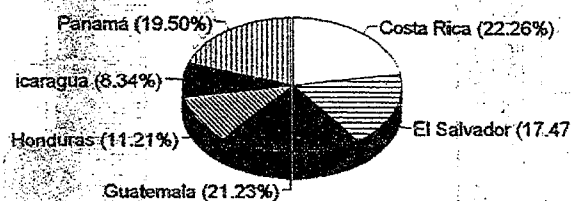
Las pérdidas corresponden a transmisión y distribución.

# ISTMO CENTROAMERICANO: RESUMEN DE LA CAPACIDAD INSTALADA

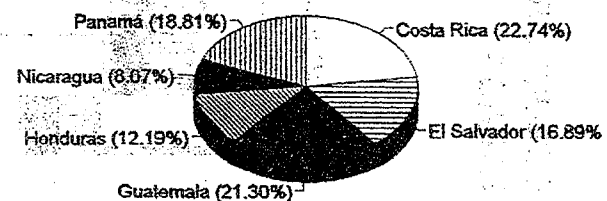
## CAPACIDAD INSTALADA POR PAIS (MW)

|             | Instalada |        | Efectiva |
|-------------|-----------|--------|----------|
|             | 1993      | 1994   | 1994     |
| Istmo       | 4679.8    | 4840.0 | 4100.6   |
| Costa Rica  | 1041.6    | 1100.7 | 1083.0   |
| El Salvador | 817.5     | 817.5  | 714.5    |
| Guatemala   | 993.3     | 1030.8 | 777.7    |
| Honduras    | 524.6     | 590.2  | 489.0    |
| Nicaragua   | 390.4     | 390.4  | 375.0    |
| Panamá      | 912.4     | 910.4  | 661.4    |

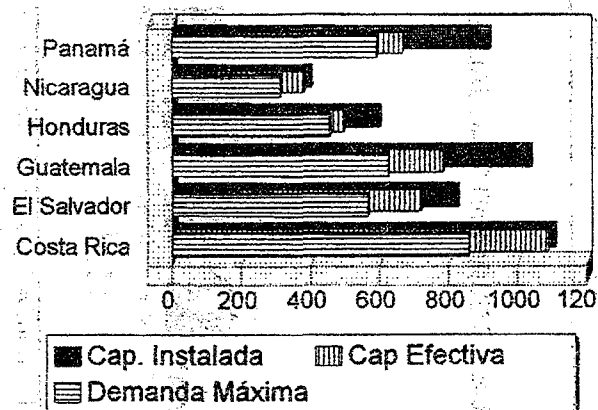
## CAPACIDAD INSTALADA, 1993



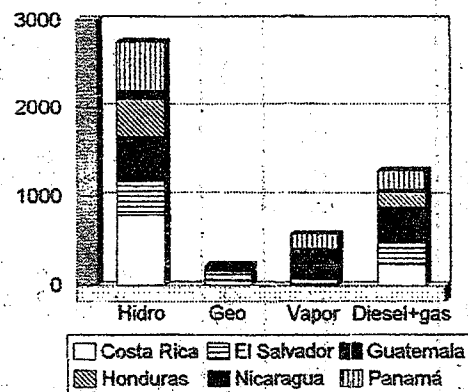
## CAPACIDAD INSTALADA, 1994



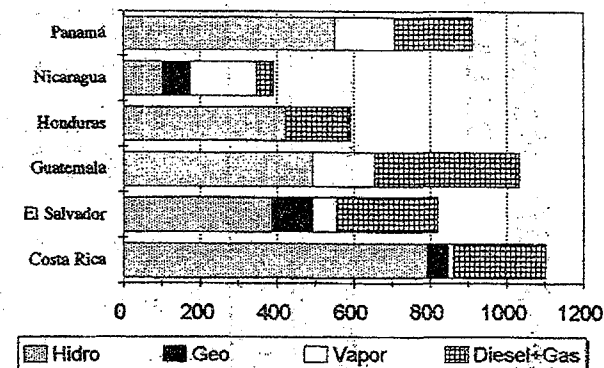
## CAPACIDAD INSTALADA, EFECTIVA Y DEMANDA MÁXIMA, 1994



## COMPOSICION POR TIPO, 1994



## COMPOSICION POR PAIS, 1994

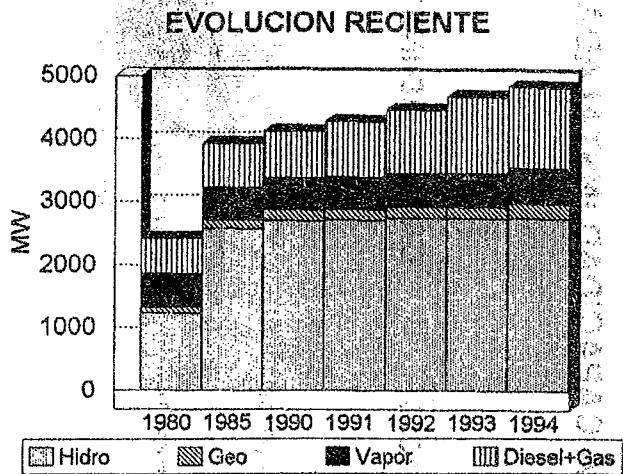


Fuente: CEPAL, sobre la base de cifras oficiales.  
Nota: Cifras preliminares para 1994.

## ISTMO CENTROAMERICANO: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

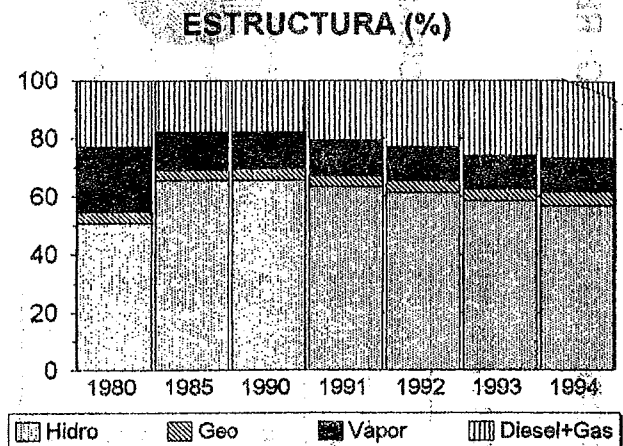
### EVOLUCION RECIENTE (MW)

| Año  | Total  | Hidro  | Geo   | Vapor | Diesel+ Gas |
|------|--------|--------|-------|-------|-------------|
| 1980 | 2420.7 | 1231.9 | 95.0  | 539.2 | 554.7       |
| 1985 | 3923.4 | 2575.5 | 130.0 | 519.5 | 698.5       |
| 1990 | 4121.3 | 2700.6 | 165.0 | 519.5 | 736.2       |
| 1991 | 4279.3 | 2709.3 | 165.0 | 521.0 | 884.0       |
| 1992 | 4466.9 | 2743.9 | 175.0 | 534.4 | 1013.6      |
| 1993 | 4679.8 | 2743.3 | 175.0 | 544.5 | 1217.0      |
| 1994 | 4840.0 | 2749.7 | 230.0 | 569.0 | 1291.4      |

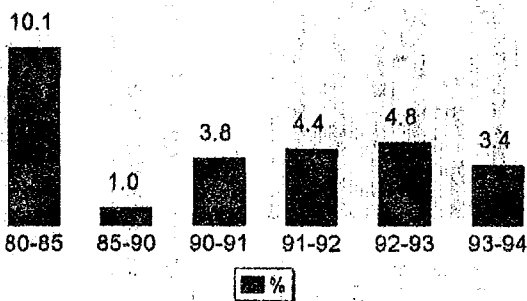


### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo | Vapor | Diesel+ Gas |
|------|-------|-------|-----|-------|-------------|
| 1980 | 100.0 | 50.9  | 3.9 | 22.3  | 22.9        |
| 1985 | 100.0 | 65.6  | 3.3 | 13.2  | 17.8        |
| 1990 | 100.0 | 65.5  | 4.0 | 12.6  | 17.9        |
| 1991 | 100.0 | 63.3  | 3.9 | 12.2  | 20.7        |
| 1992 | 100.0 | 61.4  | 3.9 | 12.0  | 22.7        |
| 1993 | 100.0 | 58.6  | 3.7 | 11.6  | 26.0        |
| 1994 | 100.0 | 56.8  | 4.8 | 11.8  | 26.7        |



### TASAS DE CRECIMIENTO ANUALES



Fuente: CEPAL, sobre la base de cifras oficiales.

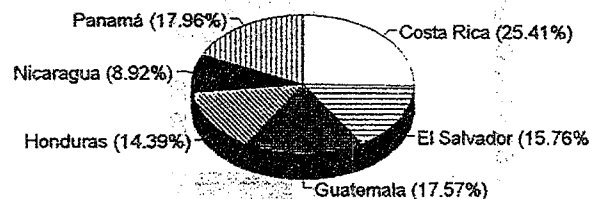
Nota: Cifras preliminares para 1994.

# ISTMO CENTROAMERICANO: RESUMEN DE LA GENERACION NETA

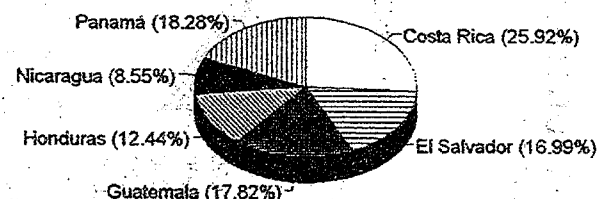
## GENERACION NETA (GWh)

|              | 1993           | 1994           |
|--------------|----------------|----------------|
| <b>Istmo</b> | <b>17253.1</b> | <b>18095.7</b> |
| Costa Rica   | 4384.4         | 4689.7         |
| El Salvador  | 2718.4         | 3075.3         |
| Guatemala    | 3030.5         | 3225.5         |
| Honduras     | 2481.9         | 2251.0         |
| Nicaragua    | 1539.6         | 1547.2         |
| Panamá       | 3098.4         | 3307.0         |

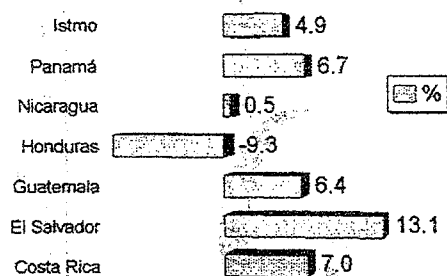
## GENERACION NETA, 1993



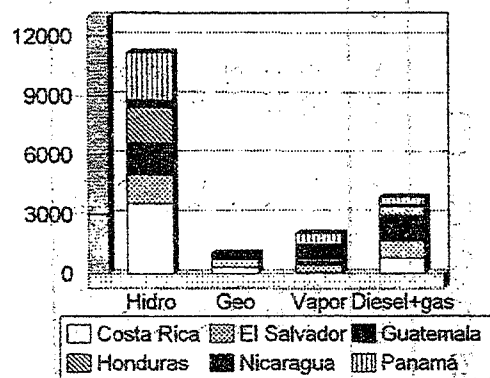
## GENERACION NETA, 1994



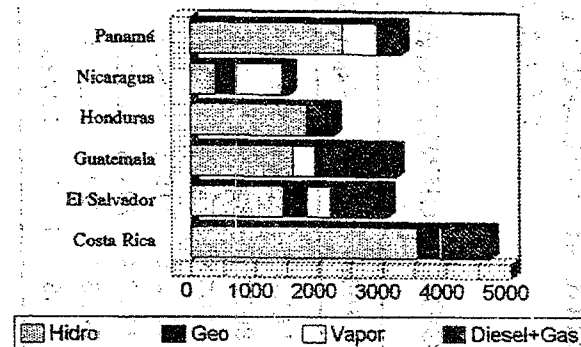
## TASAS DE CRECIMIENTO, 1993-1994



## COMPOSICION POR TIPO, 1994



## COMPOSICION POR PAIS, 1994



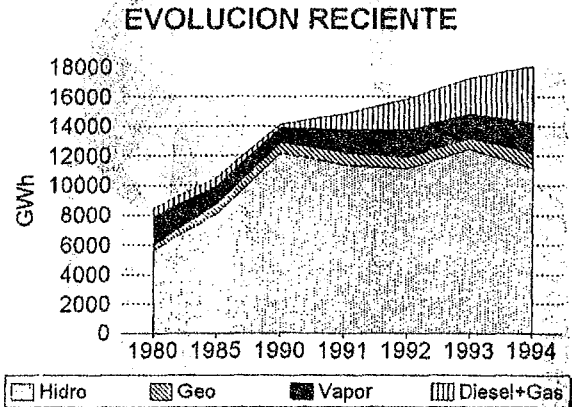
Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## ISTMO CENTROAMERICANO: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

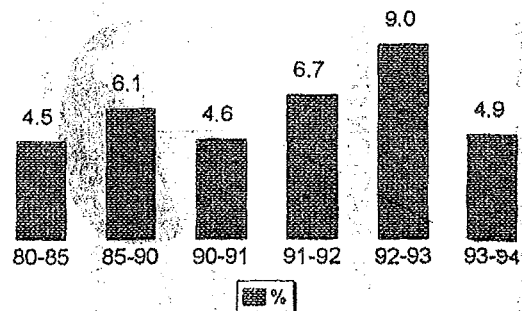
| Año  | Total   | Hidro   | Geo    | Vapor  | Diesel+Gas |
|------|---------|---------|--------|--------|------------|
| 1980 | 8466.6  | 5657.8  | 365.3  | 1862.5 | 581.0      |
| 1985 | 10562.3 | 8078.5  | 664.2  | 1237.9 | 581.7      |
| 1990 | 14175.2 | 12165.9 | 747.6  | 1013.8 | 247.9      |
| 1991 | 14830.5 | 11372.5 | 819.3  | 1554.6 | 1084.1     |
| 1992 | 15822.0 | 11120.4 | 794.3  | 1838.2 | 2069.1     |
| 1993 | 17253.1 | 12436.0 | 727.1  | 1690.4 | 2399.6     |
| 1994 | 18095.7 | 11169.3 | 1025.0 | 2023.0 | 3878.5     |



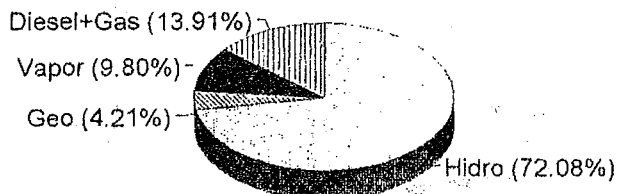
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo | Vapor | Diesel+Gas |
|------|-------|-------|-----|-------|------------|
| 1980 | 100.0 | 66.8  | 4.3 | 22.0  | 6.9        |
| 1985 | 100.0 | 76.5  | 6.3 | 11.7  | 5.5        |
| 1990 | 100.0 | 85.8  | 5.3 | 7.2   | 1.7        |
| 1991 | 100.0 | 76.7  | 5.5 | 10.5  | 7.3        |
| 1992 | 100.0 | 70.3  | 5.0 | 11.6  | 13.1       |
| 1993 | 100.0 | 72.1  | 4.2 | 9.8   | 13.9       |
| 1994 | 100.0 | 61.7  | 5.7 | 11.2  | 21.4       |

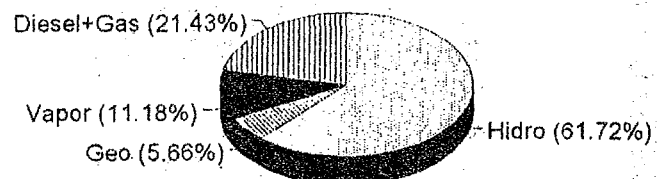
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

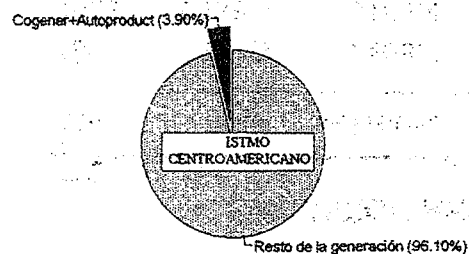
# ISTMO CENTROAMERICANO: COGENERACION Y AUTOPRODUCCION

1/

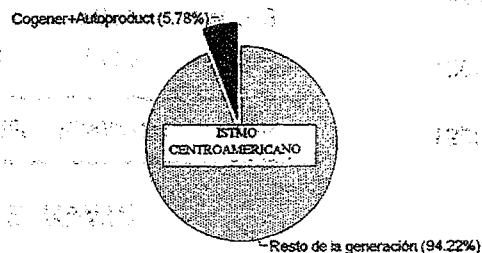
|                   | Generación (GWh) |       |        |        | Capacidad Instalada (MW) |      |      |      | Precio medio (Dólares/kWh) |       |       |       | Tasa cambiaria (Moneda local/dólar) |       |       |        |
|-------------------|------------------|-------|--------|--------|--------------------------|------|------|------|----------------------------|-------|-------|-------|-------------------------------------|-------|-------|--------|
|                   | 1991             | 1992  | 1993   | 1994   | 1991                     | 1992 | 1993 | 1994 | 1991                       | 1992  | 1993  | 1994  | 1991                                | 1992  | 1993  | 1994   |
| <b>Costa Rica</b> |                  |       |        |        |                          |      |      |      |                            |       |       |       | 122.4                               | 134.5 | 142.2 | 157.10 |
| Cogeneración      | 10.03            | 22.15 | 26.49  | 43     | 6.0                      | 8.8  | 8.5  | 14.0 | 0.032                      | 0.039 |       |       |                                     |       |       |        |
| Hidráulica        | 10.03            | 17.56 | 24.74  | 35.7   | 4.5                      | 4.8  | 4.5  | 9.0  | 0.032                      | 0.038 | n.d.  | n.d.  |                                     |       |       |        |
| Térmica           | 0                | 4.59  | 1.74   | 7.3    | 1.5                      | 4.0  | 4.0  | 5.0  | -                          | 0.044 | n.d.  | n.d.  |                                     |       |       |        |
| <b>Guatemala</b>  |                  |       |        |        |                          |      |      |      |                            |       |       |       | 4.99                                | 5.15  | 5.60  | 5.75   |
| Cogeneración 2/   | 10.04            | 17.73 | 43.42  | 52.99  | 7.5                      | 9.9  | 20   | 45.5 | n.d.                       | 0.086 | 0.055 | 0.055 |                                     |       |       |        |
| Autoprodutores 3/ | -                | -     | 602.9  | 869.91 | -                        | -    | 110  | 172  |                            |       | 0.066 | 0.063 |                                     |       |       |        |
| <b>Honduras</b>   |                  |       |        |        |                          |      |      |      |                            |       |       |       | 5.32                                | 5.54  | 6.57  | 8.50   |
| Autoprodutores 4/ |                  |       | 79.156 |        |                          |      |      | 24   |                            |       |       | 0.110 |                                     |       |       | 9.04   |

- 1/ Cogeneradores y autoprodutores integrados a los sistemas interconectados nacionales.  
 2/ incluye cogeneración térmica e hidráulica.  
 3/ corresponde a la generación de ENRON, S & S y Cementos Progreso.  
 4/ Corresponde a ELCOSA la cual inició con 24 MW con el compromiso de subir a 60 MW al final de 1994.

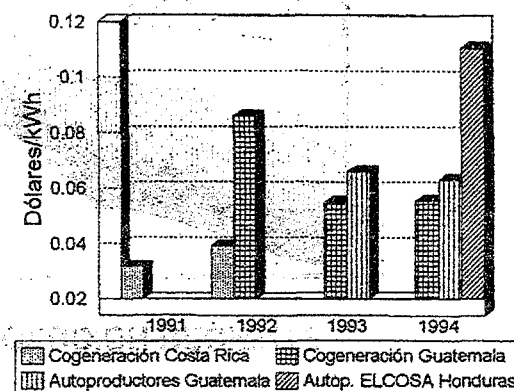
**PARTICIPACION DE LA COGENERACION Y AUTOPRODUCTORES, 1993**



**PARTICIPACION DE LA COGENERACION Y AUTOPRODUCTORES, 1994**



**PRECIO MEDIO**



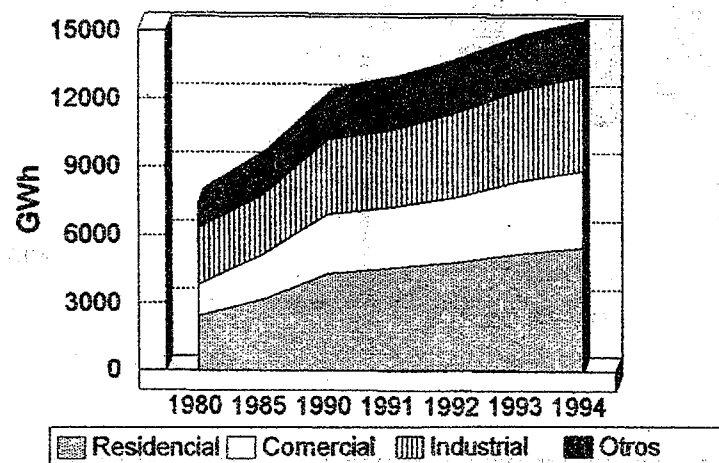
Fuente: CEPAL, sobre la base cifras oficiales.  
 Nota: Cifras preliminares para 1994.

# ISTMO CENTROAMERICANO: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

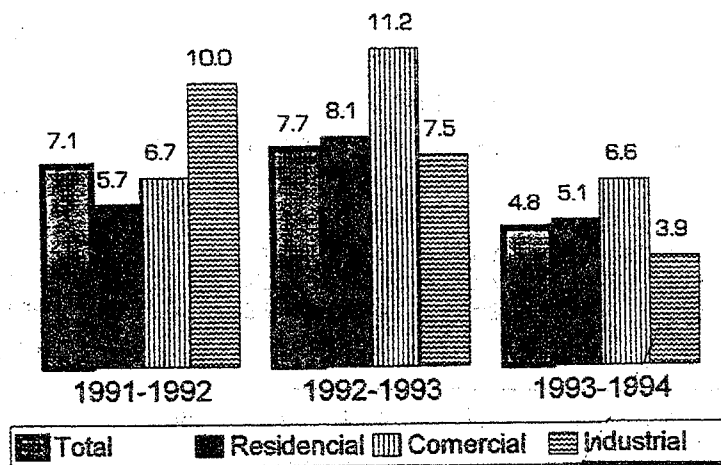
### EVOLUCION RECIENTE (GWh)

| Año  | Total   | Residencial | Comercial | Industrial | Otros  |
|------|---------|-------------|-----------|------------|--------|
| 1980 | 7397.3  | 2408.7      | 1428.1    | 2473.9     | 1086.5 |
| 1985 | 9138.5  | 3164.4      | 2014.9    | 2555.9     | 1403.3 |
| 1990 | 11813.4 | 4325.0      | 2601.5    | 3252.3     | 1634.6 |
| 1991 | 12353.3 | 4573.7      | 2652.3    | 3396.3     | 1731.0 |
| 1992 | 13236.3 | 4836.2      | 2830.3    | 3737.0     | 1832.9 |
| 1993 | 14256.5 | 5229.7      | 3148.4    | 4017.0     | 1861.4 |
| 1994 | 14945.8 | 5498.9      | 3355.9    | 4172.4     | 1918.6 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 32.6        | 19.3      | 33.4       | 14.7  |
| 1985 | 100.0 | 34.6        | 22.0      | 28.0       | 15.4  |
| 1990 | 100.0 | 36.6        | 22.0      | 27.5       | 13.8  |
| 1991 | 100.0 | 37.0        | 21.5      | 27.5       | 14.0  |
| 1992 | 100.0 | 36.5        | 21.4      | 28.2       | 13.8  |
| 1993 | 100.0 | 36.7        | 22.1      | 28.2       | 13.1  |
| 1994 | 100.0 | 36.8        | 22.5      | 27.9       | 12.8  |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

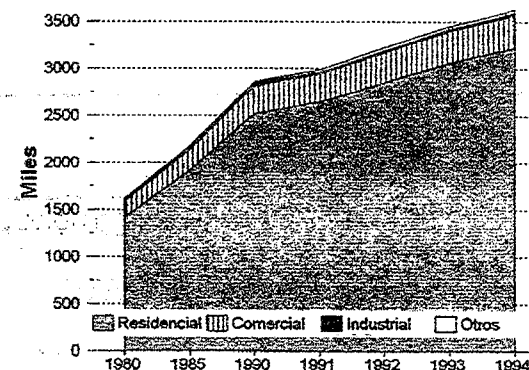
Las cifras corresponden a las ventas totales.

# ISTMO CENTROAMERICANO: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

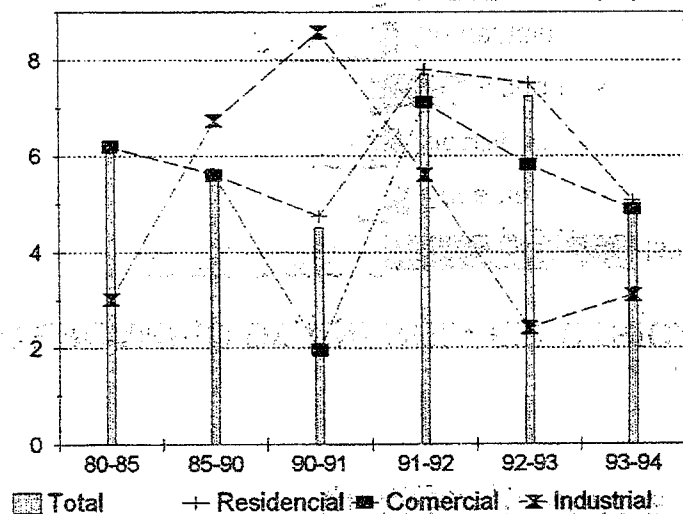
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles  |             |           |            |       | %           |           |            |       |
|------|--------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total  | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 1619.4 | 1421.1      | 162.8     | 13.8       | 21.7  | 87.8        | 10.1      | 0.9        | 1.3   |
| 1985 | 2176.6 | 1918.2      | 219.8     | 16.0       | 22.6  | 88.1        | 10.1      | 0.7        | 1.0   |
| 1990 | 2859.1 | 2522.5      | 288.7     | 22.2       | 25.7  | 88.2        | 10.1      | 0.8        | 0.9   |
| 1991 | 2988.0 | 2641.9      | 294.4     | 24.1       | 27.6  | 88.4        | 9.9       | 0.8        | 0.9   |
| 1992 | 3218.2 | 2848.1      | 315.3     | 25.4       | 29.4  | 88.5        | 9.8       | 0.8        | 0.9   |
| 1993 | 3451.5 | 3062.2      | 333.6     | 26.0       | 29.6  | 88.7        | 9.7       | 0.8        | 0.9   |
| 1994 | 3624.3 | 3217.5      | 349.9     | 26.8       | 30.0  | 88.8        | 9.7       | 0.7        | 0.8   |

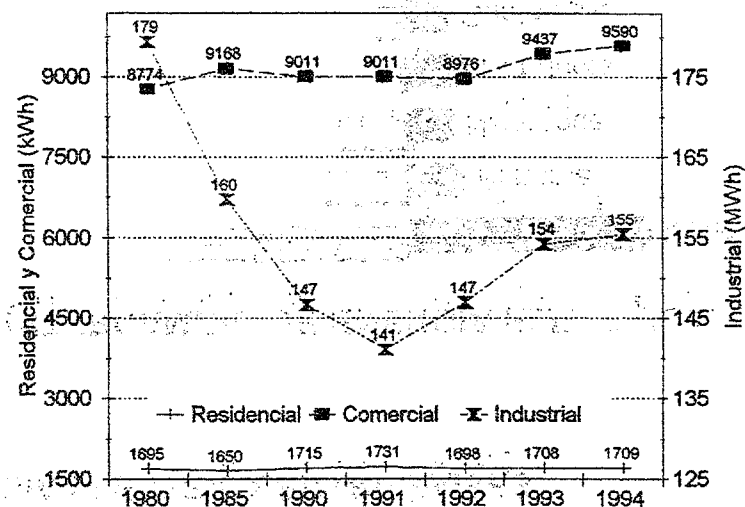
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

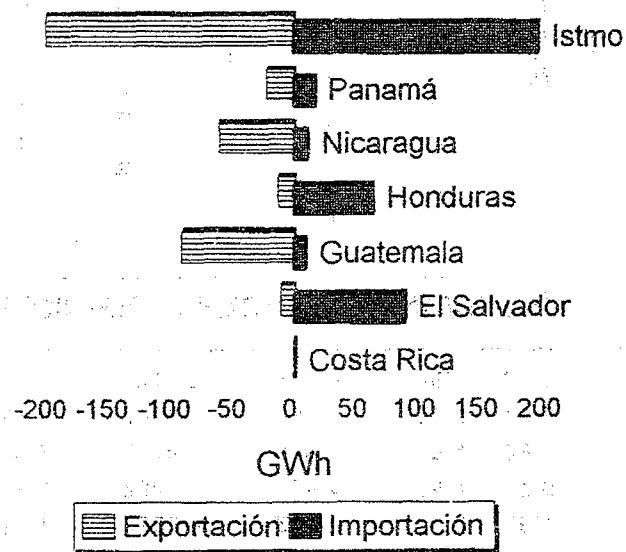
Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

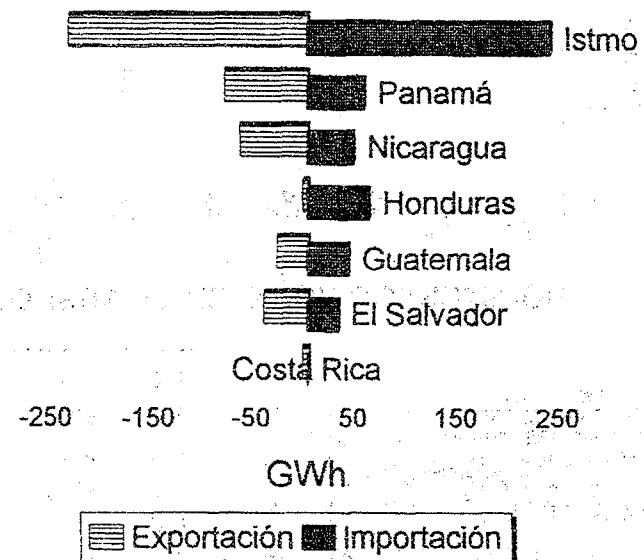


## ISTMO CENTROAMERICANO: EVOLUCION RECIENTE DE LOS INTERCAMBIOS DE ENERGIA ELECTRICA ENTRE PAISES

### INTERCAMBIO DE ENERGIA ELECTRICA, 1993



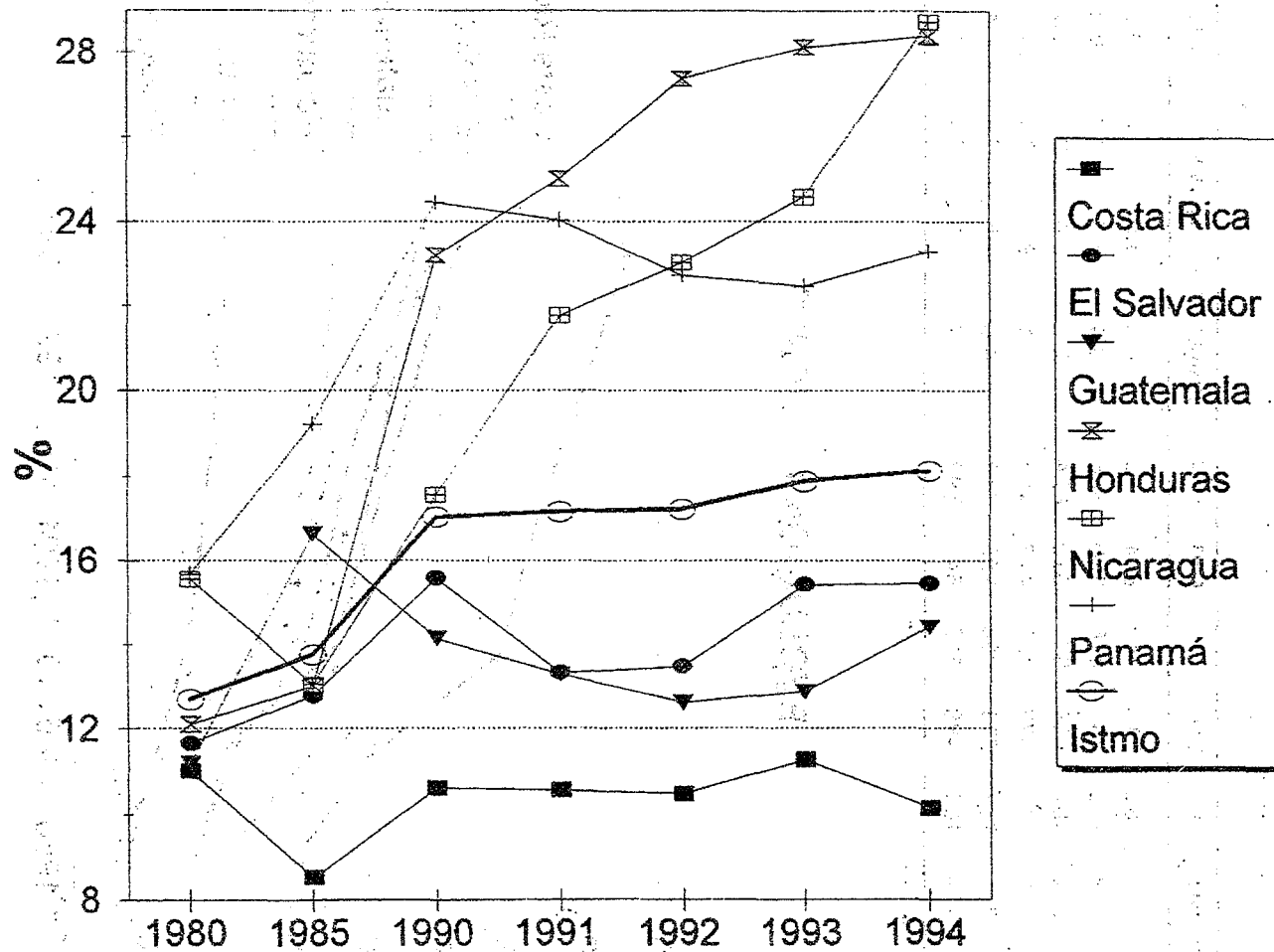
### INTERCAMBIO DE ENERGIA ELECTRICA, 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## ISTMO CENTROAMERICANO: EVOLUCION DE LAS PERDIDAS ELECTRICAS



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

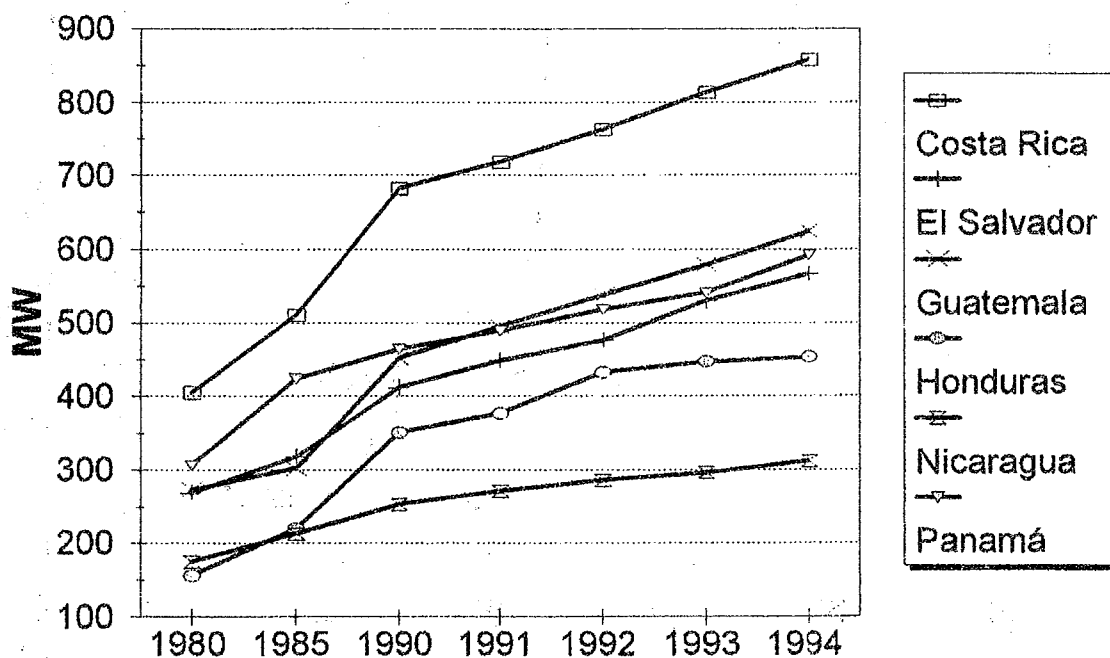
Las pérdidas corresponden a transmisión y distribución.

## ISTMO CENTROAMERICANO: EVOLUCION DE LA DEMANDA MAXIMA

### EVOLUCION RECIENTE Y TASAS DE CRECIMIENTO

|             | (MW) |      |      |      |      |      |      | (%)     |         |         |         |         |         |
|-------------|------|------|------|------|------|------|------|---------|---------|---------|---------|---------|---------|
|             | 1980 | 1985 | 1990 | 1991 | 1992 | 1993 | 1994 | 1980-85 | 1985-90 | 1990-91 | 1991-92 | 1992-93 | 1993-94 |
| Costa Rica  | 405  | 511  | 682  | 718  | 763  | 814  | 858  | 4.8     | 5.9     | 5.3     | 6.3     | 6.7     | 5.4     |
| El Salvador | 269  | 318  | 412  | 448  | 476  | 530  | 566  | 3.4     | 5.3     | 8.7     | 6.3     | 11.3    | 6.8     |
| Guatemala   | 273  | 302  | 452  | 495  | 538  | 579  | 624  | 2.0     | 8.4     | 9.5     | 8.7     | 7.6     | 7.8     |
| Honduras    | 156  | 220  | 351  | 377  | 433  | 447  | 453  | 7.1     | 9.8     | 7.4     | 14.9    | 3.2     | 1.3     |
| Nicaragua   | 175  | 213  | 253  | 271  | 286  | 296  | 312  | 4.0     | 3.5     | 7.1     | 5.5     | 3.5     | 5.4     |
| Panamá      | 306  | 424  | 464  | 489  | 518  | 541  | 592  | 6.7     | 1.8     | 5.4     | 5.9     | 4.4     | 9.4     |

### EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

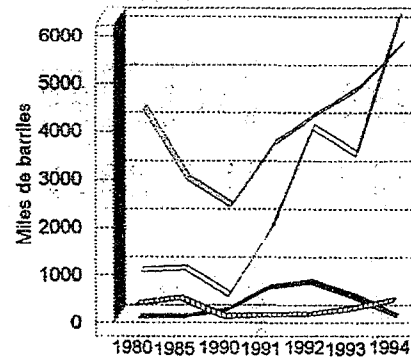
Nota: Cifras preliminares para 1994.

# ISTMO CENTROAMERICANO: USO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

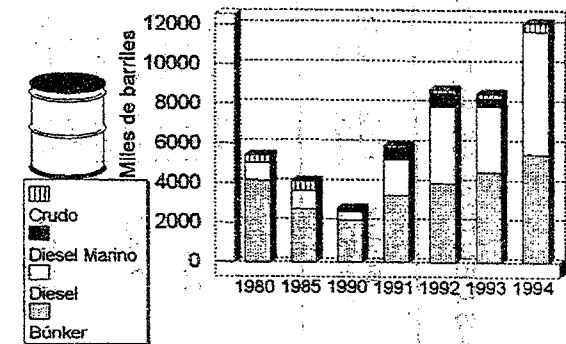
## EVOLUCION RECIENTE (Miles de barriles)

| Año  | Total   | Búnker | Diesel | Diesel Marino | Crudo |
|------|---------|--------|--------|---------------|-------|
| 1980 | 5415.1  | 4159.1 | 881.3  | 0.0           | 374.7 |
| 1985 | 4129.2  | 2704.7 | 930.1  | 0.0           | 494.4 |
| 1990 | 2761.1  | 2141.3 | 372.4  | 137.1         | 110.3 |
| 1991 | 5935.6  | 3420.1 | 1761.7 | 618.1         | 135.7 |
| 1992 | 8750.4  | 4025.3 | 3851.6 | 725.0         | 148.5 |
| 1993 | 8556.2  | 4582.8 | 3290.7 | 422.1         | 260.6 |
| 1994 | 12126.8 | 5491.9 | 6181.7 | 8.8           | 444.4 |

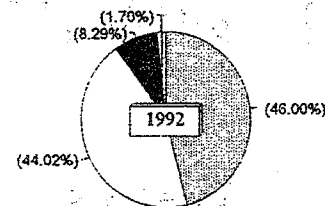
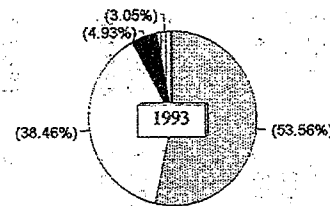
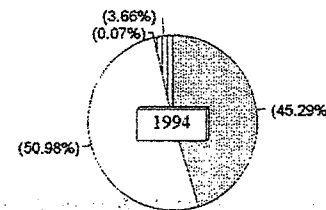
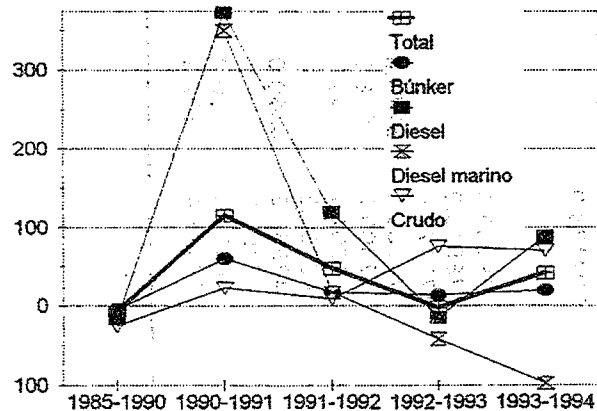
## EVOLUCION RECIENTE



## CONSUMO ACUMULADO ANUAL

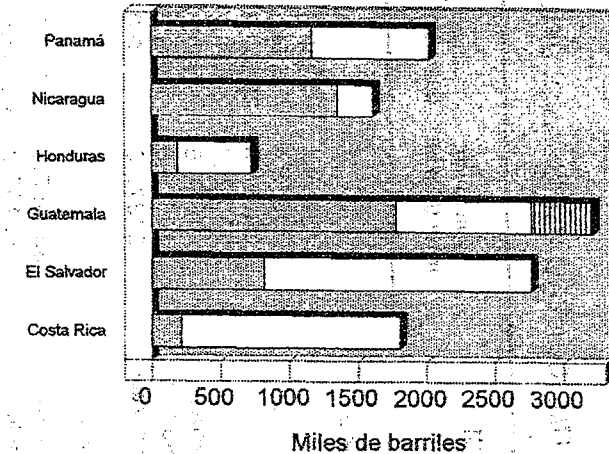


## CRECIMIENTO PROMEDIO ANUAL (%)



## ESTRUCTURA

## CONSUMO POR PAIS, 1994



Fuente: CEPAL, sobre la base de cifras oficiales.  
Nota: Cifras preliminares para 1994.

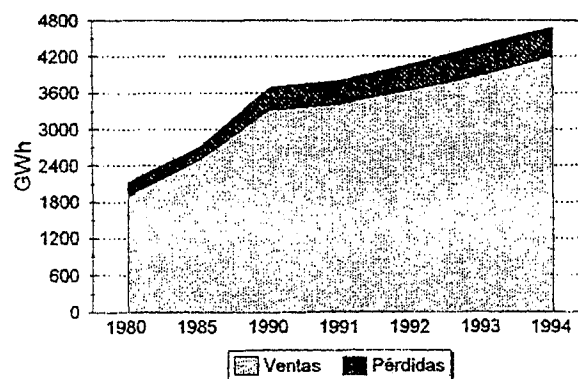
## ISTMO CENTROAMERICANO: EFICIENCIA DE LAS CENTRALES ELECTRICAS, 1993

| Pafs/Central       | Generación<br>bruta (MWh) | Diesel<br>000's Gal | Diesel marino<br>000's Gal | Búnker<br>000's Gal | kWh<br>galón | kWh<br>barril | kWh<br>litro | Eficiencia<br>% |
|--------------------|---------------------------|---------------------|----------------------------|---------------------|--------------|---------------|--------------|-----------------|
| <b>Costa Rica</b>  |                           |                     |                            |                     |              |               |              |                 |
| Barranca           | 19769.4                   | 2359.4              |                            |                     | 8.4          | 351.9         | 2.2          | 20.6            |
| Colima             | 33893.4                   | 364.3               |                            | 2240.7              | 13.0         | 546.5         | 3.4          | 29.8            |
| Mofn Gas           | 280863.5                  | 25542.5             |                            |                     | 11.0         | 461.8         | 2.9          | 27.0            |
| Mofn               | 21022.2                   | 628.2               |                            | 754.2               | 15.2         | 638.7         | 4.0          | 35.7            |
| Puerto Jiménez     | 1656.6                    | 158.0               |                            |                     | 10.5         | 440.4         | 2.8          | 25.8            |
| San Antonio-Gas    | 40618.0                   | 4496.9              |                            |                     | 9.0          | 379.4         | 2.4          | 22.2            |
| San Antonio-Vapor  | 24977.3                   | 0.0                 |                            | 2815.2              | 8.9          | 372.6         | 2.4          | 20.1            |
| <b>El Salvador</b> |                           |                     |                            |                     |              |               |              |                 |
| Acajutla (Vapor)   | 354493.1                  | 23.2                |                            | 30729.0             | 11.5         | 484.2         | 3.1          | 26.1            |
| Acajutla (Gas)     | 482463.0                  | 43986.6             |                            |                     | 11.0         | 460.7         | 2.9          | 27.0            |
| Miravalles         | 9380.0                    | 21.2                |                            | 639.8               | 14.2         | 596.0         | 3.8          | 32.3            |
| San Miguel         | 38610.2                   | 3787.6              |                            |                     | 10.2         | 428.1         | 2.7          | 25.1            |
| <b>Guatemala</b>   |                           |                     |                            |                     |              |               |              |                 |
| Escuintla Vapor II | 99124.1                   | 86.7                |                            | 8208.4              | 12.0         | 501.9         | 3.2          | 27.1            |
| Escuintla Gas II   | 2391.3                    | 313.1               |                            |                     | 7.6          | 320.8         | 2.0          | 18.8            |
| Escuintla Gas III  | 11698.0                   | 1215.3              |                            |                     | 9.6          | 404.3         | 2.6          | 23.7            |
| Escuintla Gas IV   | 38543.0                   | 3833.9              |                            | 0.0                 | 10.1         | 422.2         | 2.7          | 24.7            |
| Escuintla Gas V    | 6443.0                    | 718.1               |                            |                     | 9.0          | 376.8         | 2.4          | 22.1            |
| Escuintla Gas VI   | 93144.0                   | 7185.7              |                            |                     | 13.0         | 544.4         | 3.4          | 31.9            |
| Puerto Barrios     | 903.1                     | 82.0                |                            |                     | 11.0         | 462.6         | 2.9          | 27.1            |
| San Felipe         | 56.0                      | 4.1                 |                            |                     | 13.7         | 573.7         | 3.6          | 33.6            |
| <b>Honduras</b>    |                           |                     |                            |                     |              |               |              |                 |
| Alsthom            | 95926.5                   | 6434.1              | 641.6                      |                     | 13.6         | 569.4         | 3.6          | 33.3            |
| La Ceiba           | 34886.7                   | 2052.5              | 495.5                      | 47.1                | 13.4         | 564.6         | 3.6          | 33.0            |
| Sulzer             | 100279.3                  | 4691.6              | 1525.0                     | 14.3                | 16.1         | 675.9         | 4.3          | 39.6            |
| <b>Nicaragua</b>   |                           |                     |                            |                     |              |               |              |                 |
| José D. Estrada    | 19013.0                   | 1852.7              |                            |                     | 10.3         | 431.0         | 2.7          | 25.2            |
| Managua (Vapor)    | 197153.6                  |                     |                            | 18646.0             | 10.6         | 444.1         | 2.8          | 24.0            |
| Nicaragua          | 507188.0                  |                     |                            | 38479.0             | 13.2         | 553.6         | 3.5          | 29.9            |
| <b>Panamá</b>      |                           |                     |                            |                     |              |               |              |                 |
| 9 de Enero 1       | 59789.9                   |                     |                            | 5193.3              | 11.5         | 483.5         | 3.1          | 26.1            |
| 9 de Enero 3       | 178915.0                  |                     |                            | 14705.9             | 12.2         | 511.0         | 3.2          | 27.6            |
| 9 de Enero 4       | 172177.6                  |                     |                            | 15944.5             | 10.8         | 453.5         | 2.9          | 24.5            |
| 9 de Enero 7       | 71530.6                   | 5279.8              |                            |                     | 13.6         | 569.0         | 3.6          | 33.3            |
| Capira             | 7300.2                    | 618.2               |                            |                     | 11.8         | 496.0         | 3.1          | 29.0            |
| Chitré             | 1804.7                    | 147.8               |                            |                     | 12.2         | 512.8         | 3.2          | 30.0            |
| 9 de Enero JBG     | 146192.8                  |                     | 15067.1                    |                     | 9.7          | 407.5         | 2.6          | 23.9            |
| Mt. Hope           | 43563.2                   | 4880.0              |                            |                     | 8.9          | 374.9         | 2.4          | 21.9            |
| Pielstick          | 7497.8                    |                     |                            | 408.7               | 18.4         | 770.5         | 4.9          | 41.6            |
| San Francisco (V)  | 66462.0                   | 0.0                 |                            | 7121.9              | 9.3          | 392.0         | 2.5          | 21.2            |
| Subest. Panamá     | 86418.4                   | 9302.2              |                            |                     | 9.3          | 390.2         | 2.5          | 22.8            |

## COSTA RICA: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |            |               | %      |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponible | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 584.8               | 405            | 2122.5                  | 0.0         | 2.3         | 2.9     | 2127.7     | n.d.          | 1893.6 | 11.0     | 60.0            |
| 1985 | 777.1               | 511            | 2761.9                  | 59.9        | 0.0         | 0.0     | 2702.1     | n.d.          | 2471.6 | 8.5      | 60.4            |
| 1990 | 888.6               | 682            | 3543.0                  | 31.9        | 186.3       | 0.0     | 3697.4     | n.d.          | 3304.8 | 10.6     | 61.9            |
| 1991 | 1007.1              | 718            | 3806.4                  | 86.6        | 93.5        | 0.0     | 3813.4     | -             | 3410.8 | 10.6     | 60.6            |
| 1992 | 1042.4              | 763            | 4125.3                  | 98.0        | 33.9        | 17.6    | 4078.7     | -             | 3651.5 | 10.5     | 61.0            |
| 1993 | 1041.6              | 814            | 4357.9                  | 1.5         | 1.5         | 26.5    | 4384.4     | -             | 3890.2 | 11.3     | 61.5            |
| 1994 | 1100.7              | 858            | 4646.7                  | 6.4         | 0.0         | 43.0    | 4683.3     | -             | 4208.6 | 10.1     | 62.3            |

**DISTRIBUCION DE LA ENERGIA DISPONIBLE**



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con otros países.

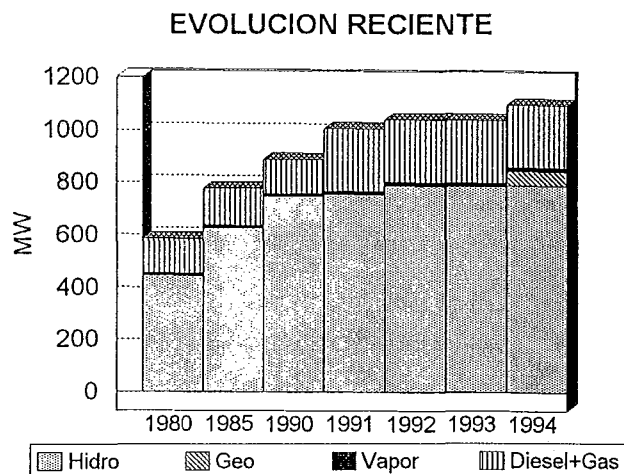
Las compras corresponden a transacciones internas en el país con otras empresas.

Las pérdidas corresponden a transmisión y distribución.

## COSTA RICA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

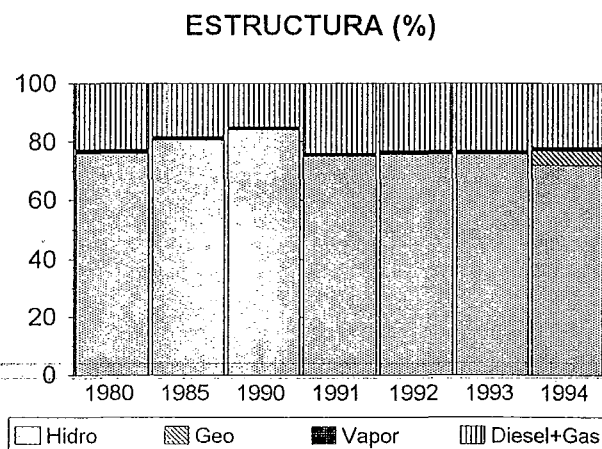
### EVOLUCION RECIENTE (MW)

| Año  | Total  | Hidro | Geo  | Vapor | Diesel+Gas |
|------|--------|-------|------|-------|------------|
| 1980 | 584.8  | 443.5 | 0.0  | 10.0  | 131.2      |
| 1985 | 777.1  | 625.6 | 0.0  | 10.0  | 141.6      |
| 1990 | 888.6  | 747.3 | 0.0  | 10.0  | 131.2      |
| 1991 | 1007.1 | 756.0 | 0.0  | 11.5  | 239.5      |
| 1992 | 1042.4 | 788.6 | 0.0  | 14.0  | 239.7      |
| 1993 | 1041.6 | 788.0 | 0.0  | 14.0  | 239.5      |
| 1994 | 1100.7 | 791.2 | 55.0 | 15.0  | 239.5      |

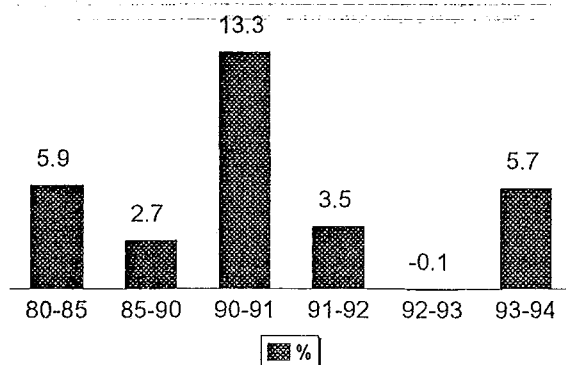


### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo | Vapor | Diesel+Gas |
|------|-------|-------|-----|-------|------------|
| 1980 | 100.0 | 75.8  | 0.0 | 1.7   | 22.4       |
| 1985 | 100.0 | 80.5  | 0.0 | 1.3   | 18.2       |
| 1990 | 100.0 | 84.1  | 0.0 | 1.1   | 14.8       |
| 1991 | 100.0 | 75.1  | 0.0 | 1.1   | 23.8       |
| 1992 | 100.0 | 75.7  | 0.0 | 1.3   | 23.0       |
| 1993 | 100.0 | 75.7  | 0.0 | 1.3   | 23.0       |
| 1994 | 100.0 | 71.9  | 5.0 | 1.4   | 21.8       |



### TAÑAS DE CRECIMIENTO ANUALES



Fuente: CEPAL, sobre la base de cifras oficiales.

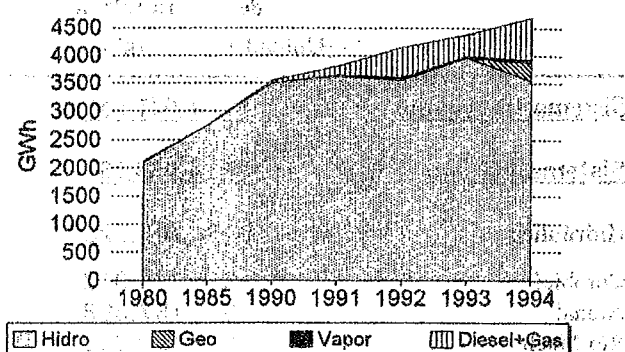
Nota: Cifras preliminares para 1994.

## COSTA RICA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro  | Geo   | Vapor | Diesel+Gas |
|------|--------|--------|-------|-------|------------|
| 1980 | 2122.5 | 2097.6 | 0.0   | 3.1   | 21.9       |
| 1985 | 2761.9 | 2757.6 | 0.0   | 0.3   | 4.0        |
| 1990 | 3543.0 | 3497.4 | 0.0   | 0.0   | 45.6       |
| 1991 | 3806.4 | 3630.4 | 0.0   | 14.0  | 162.0      |
| 1992 | 4142.9 | 3559.5 | 0.0   | 41.6  | 541.8      |
| 1993 | 4384.4 | 3961.5 | 0.0   | 26.7  | 396.2      |
| 1994 | 4689.7 | 3547.4 | 324.0 | 46.3  | 772.0      |

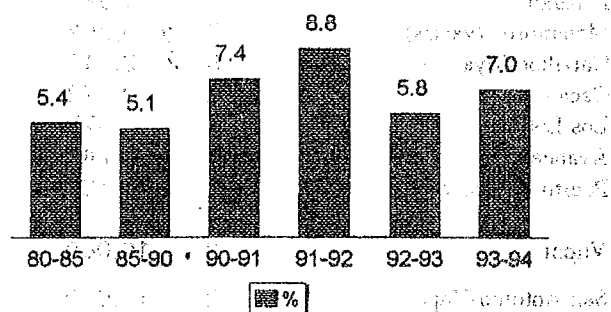
### EVOLUCION RECIENTE



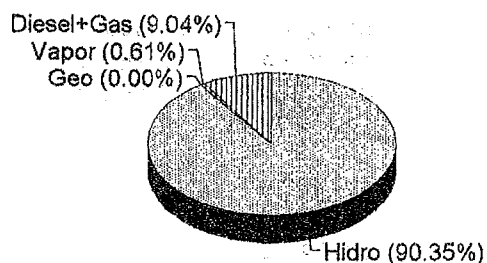
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo | Vapor | Diesel+Gas |
|------|-------|-------|-----|-------|------------|
| 1980 | 100.0 | 98.8  | 0.0 | 0.1   | 1.0        |
| 1985 | 100.0 | 99.8  | 0.0 | 0.0   | 0.1        |
| 1990 | 100.0 | 98.7  | 0.0 | 0.0   | 1.3        |
| 1991 | 100.0 | 95.4  | 0.0 | 0.4   | 4.3        |
| 1992 | 100.0 | 85.9  | 0.0 | 1.0   | 13.1       |
| 1993 | 100.0 | 90.4  | 0.0 | 0.6   | 9.0        |
| 1994 | 100.0 | 75.6  | 6.9 | 1.0   | 16.5       |

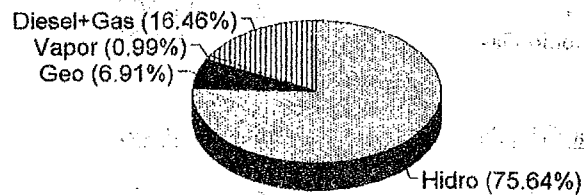
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.  
Nota: Cifras preliminares para 1994.



## COSTA RICA: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número<br>de<br>Unidades | Potencia<br>Instalada<br>(kW) | (MWh)               |                   |                    | Consumo<br>(Miles de galones) |                |
|--------------------------|--------------------------|-------------------------------|---------------------|-------------------|--------------------|-------------------------------|----------------|
|                          |                          |                               | Generación<br>bruta | Consumo<br>propio | Generación<br>neta | Diesel                        | Fuel Oil       |
| <b>Sistema Integrado</b> | <b>85</b>                | <b>1,041,565</b>              |                     |                   | <b>4,384,398.4</b> | <b>33,391.3</b>               | <b>5,810.1</b> |
| <b>Sistema Público</b>   | <b>80</b>                | <b>1,033,068</b>              |                     |                   | <b>4,357,910.4</b> | <b>33,391.3</b>               | <b>5,810.1</b> |
| <b>Hidráulica</b>        | <b>61</b>                | <b>783,528</b>                |                     |                   | <b>3,936,766.6</b> |                               |                |
| Corobicí                 | 3                        | 174,012                       |                     |                   | 831,317.7          |                               |                |
| Arenal                   | 3                        | 157,398                       |                     |                   | 716,936.0          |                               |                |
| Río Macho                | 5                        | 120,000                       |                     |                   | 621,542.7          |                               |                |
| Cachí                    | 3                        | 100,800                       |                     |                   | 652,792.2          |                               |                |
| Garita 3,4               | 2                        | 97,380                        |                     |                   | 478,640.0          |                               |                |
| Total CNFL               | 19                       | 37,472                        |                     |                   | 165,937.1          |                               |                |
| Sandillal                | 2                        | 31,977                        |                     |                   | 130,448.0          |                               |                |
| Garita 1,2               | 2                        | 30,000                        |                     |                   | 172,162.1          |                               |                |
| Birris 1-2-3             | 4                        | 22,720                        |                     |                   | 89,521.5           |                               |                |
| Echandi                  | 1                        | 4,696                         |                     |                   | 29,206.0           |                               |                |
| Matamoros (varias)       | 7                        | 3,262                         |                     |                   | 20,894.2           |                               |                |
| Carrillos-Joya           | 5                        | 2,340                         |                     |                   | 18,942.6           |                               |                |
| Cacao                    | 2                        | 672                           |                     |                   | 4,000.5            |                               |                |
| Los Lotes                | 1                        | 375                           |                     |                   | 1,626.7            |                               |                |
| Avance                   | 1                        | 240                           |                     |                   | 1,807.2            |                               |                |
| Puerto Escondido         | 1                        | 184                           |                     |                   | 992.1              |                               |                |
| <b>Vapor</b>             | <b>2</b>                 | <b>10,000</b>                 |                     |                   | <b>24,977.3</b>    | <b>0.0</b>                    | <b>2,815.2</b> |
| San Antonio-Vapor        | 2                        | 10,000                        |                     |                   | 24,977.3           |                               | 2,815.2        |
| <b>Diesel</b>            | <b>10</b>                | <b>51,540</b>                 |                     |                   | <b>54,915.6</b>    | <b>992.5</b>                  | <b>2,994.9</b> |
| Moín                     | 4                        | 32,000                        |                     |                   | 21,022.2           | 628.2                         | 754.2          |
| Colima                   | 6                        | 19,540                        |                     |                   | 33,893.4           | 364.3                         | 2,240.7        |
| <b>Turbogas</b>          | <b>7</b>                 | <b>188,000</b>                |                     |                   | <b>341,250.9</b>   | <b>32,398.8</b>               | <b>0.0</b>     |
| Moín Gas                 | 3                        | 108,300                       |                     |                   | 280,863.5          | 25,542.5                      |                |
| Barranca                 | 2                        | 41,600                        |                     |                   | 19,769.4           | 2,359.4                       |                |
| San Antonio-Gas          | 2                        | 38,100                        |                     |                   | 40,618.0           | 4,496.9                       |                |
| <b>Sistema Privado</b>   | <b>5</b>                 | <b>8,497</b>                  |                     |                   | <b>26,488.0</b>    |                               |                |
| Cogeneración Hidro       | 4                        | 4,497                         |                     |                   | 24,746.6           |                               |                |
| Cogeneración Térmica     | 1                        | 4,000                         |                     |                   | 1,741.4            |                               |                |

Fuente: CEPAL, sobre la base de cifras oficiales.

## COSTA RICA: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil       |
| <b>Sistema Integrado</b> | <b>111</b>         | <b>1,100,699</b>        | <b>4,723,479.3</b> | <b>33,801.3</b> | <b>4,689,678.0</b> | <b>66,780.0</b>            | <b>8,862.0</b> |
| <b>Sistema Público</b>   | <b>85</b>          | <b>1,086,703</b>        | <b>4,680,479.3</b> | <b>33,801.3</b> | <b>4,646,678.0</b> | <b>66,780.0</b>            | <b>8,862.0</b> |
| <b>Hidráulica</b>        | <b>64</b>          | <b>782,163</b>          | <b>3,517,678.0</b> | <b>6,000.0</b>  | <b>3,511,678.0</b> |                            |                |
| Corobicí                 | 3                  | 174,012                 | 768,174.8          |                 |                    |                            |                |
| Arenal                   | 3                  | 157,398                 | 648,290.0          |                 |                    |                            |                |
| Río Macho                | 5                  | 120,000                 | 523,305.0          |                 |                    |                            |                |
| Cachí                    | 3                  | 100,800                 | 597,138.8          |                 |                    |                            |                |
| Garita 3,4               | 2                  | 97,380                  | 398,627.2          |                 |                    |                            |                |
| Total CNFL               | 19                 | 34,475                  | 147,397.9          |                 |                    |                            |                |
| Sandillal                | 2                  | 31,978                  | 121,807.5          |                 |                    |                            |                |
| Garita 1,2               | 2                  | 30,000                  | 158,120.7          |                 |                    |                            |                |
| Birris 1-2-3             | 7                  | 24,420                  | 87,086.3           |                 |                    |                            |                |
| Echandi                  | 1                  | 4,696                   | 25,859.4           |                 |                    |                            |                |
| Matamoros (varias)       | 7                  | 3,193                   | 17,772.2           |                 |                    |                            |                |
| Carrillos-Joya           | 5                  | 2,340                   | 15,115.4           |                 |                    |                            |                |
| Cacao                    | 2                  | 672                     | 4,195.0            |                 |                    |                            |                |
| Los Lotes                | 1                  | 375                     | 1,866.0            |                 |                    |                            |                |
| Avance                   | 1                  | 240                     | 1,452.3            |                 |                    |                            |                |
| Puerto Escondido         | 1                  | 184                     | 1,469.5            |                 |                    |                            |                |
| <b>Geotérmica</b>        | <b>2</b>           | <b>55,000</b>           | <b>341,794.6</b>   | <b>17,794.6</b> | <b>324,000.0</b>   |                            |                |
| Miravalles               | 2                  | 55,000                  | 341,794.6          | 17,794.6        | 324,000.0          |                            |                |
| <b>Vapor</b>             | <b>2</b>           | <b>10,000</b>           | <b>39,833.9</b>    | <b>833.9</b>    | <b>39,000.0</b>    |                            |                |
| San Antonio-Vapor        | 2                  | 10,000                  | 39,833.9           | 833.9           | 39,000.0           |                            |                |
| <b>Diesel</b>            | <b>10</b>          | <b>51,540</b>           | <b>85,976.3</b>    | <b>1,010.0</b>  | <b>85,976.3</b>    |                            |                |
| Moín                     | 4                  | 32,000                  | 25,504.1           |                 | 25,504.1           |                            |                |
| Colima                   | 6                  | 19,540                  | 60,472.2           |                 | 60,472.2           |                            |                |
| <b>Turbogas</b>          | <b>7</b>           | <b>188,000</b>          | <b>695,196.5</b>   | <b>8,162.8</b>  | <b>686,023.7</b>   |                            |                |
| Moín Gas                 | 3                  | 108,300                 | 523,643.8          |                 | 514,471.0          |                            |                |
| Barranca                 | 2                  | 41,600                  | 67,414.7           |                 | 67,414.7           |                            |                |
| San Antonio-Gas          | 2                  | 38,100                  | 104,138.0          |                 | 104,138.0          |                            |                |
| <b>Sistema Privado</b>   | <b>26</b>          | <b>13,996</b>           | <b>43,000.0</b>    |                 | <b>43,000.0</b>    |                            |                |
| Cogeneración Hidro       | 25                 | 8,996                   | 35,700.0           |                 | 35,700.0           |                            |                |
| Cogeneración Térmica     | 1                  | 5,000                   | 7,300.0            |                 | 7,300.0            |                            |                |

Fuente: CEPAL, sobre la base de cifras oficiales.

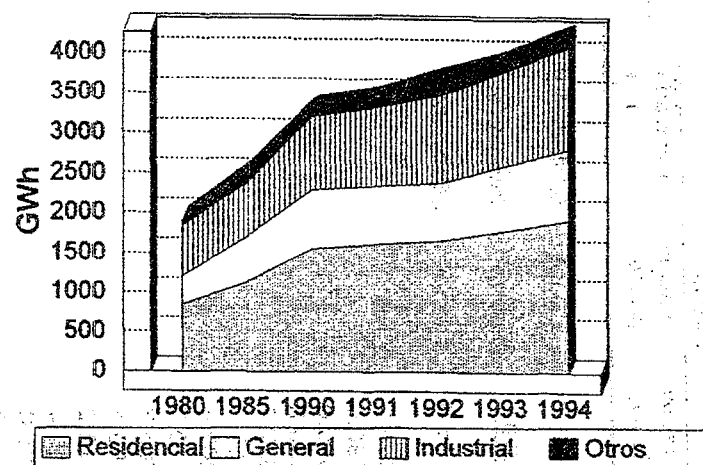
Nota: Cifras preliminares.

## COSTA RICA: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

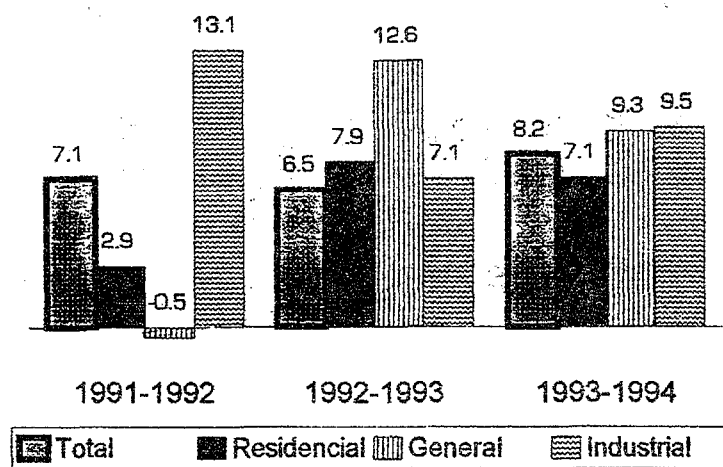
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | General | Industrial | Otros |
|------|--------|-------------|---------|------------|-------|
| 1980 | 1893.6 | 843.0       | 355.2   | 638.3      | 57.0  |
| 1985 | 2471.6 | 1122.8      | 575.9   | 674.6      | 98.2  |
| 1990 | 3304.8 | 1560.4      | 729.8   | 921.1      | 93.6  |
| 1991 | 3410.8 | 1614.2      | 725.9   | 968.7      | 101.9 |
| 1992 | 3651.5 | 1661.1      | 722.1   | 1095.9     | 172.4 |
| 1993 | 3890.2 | 1791.6      | 813.3   | 1173.2     | 112.1 |
| 1994 | 4208.6 | 1918.6      | 888.8   | 1284.4     | 116.8 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | General | Industrial | Otros |
|------|-------|-------------|---------|------------|-------|
| 1980 | 100.0 | 44.5        | 18.8    | 33.7       | 3.0   |
| 1985 | 100.0 | 45.4        | 23.3    | 27.3       | 4.0   |
| 1990 | 100.0 | 47.2        | 22.1    | 27.9       | 2.8   |
| 1991 | 100.0 | 47.3        | 21.3    | 28.4       | 3.0   |
| 1992 | 100.0 | 45.5        | 19.8    | 30.0       | 4.7   |
| 1993 | 100.0 | 46.1        | 20.9    | 30.2       | 2.9   |
| 1994 | 100.0 | 45.6        | 21.1    | 30.5       | 2.8   |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

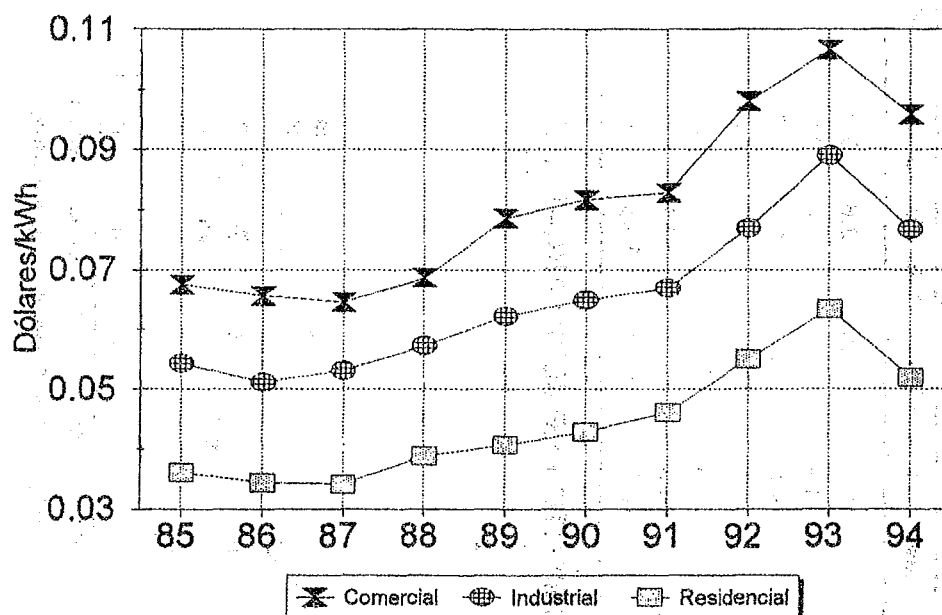
## COSTA RICA: PRECIOS PROMEDIO

## EVOLUCION RECIENTE

Dólares/kWh

| AÑO  | RESIDENCIAL | GENERAL | INDUSTRIAL | COLONES<br>POR DOLAR |
|------|-------------|---------|------------|----------------------|
| 1985 | 0.036       | 0.067   | 0.054      | 50.45                |
| 1986 | 0.034       | 0.066   | 0.051      | 56.02                |
| 1987 | 0.034       | 0.064   | 0.053      | 62.77                |
| 1988 | 0.039       | 0.069   | 0.057      | 75.80                |
| 1989 | 0.041       | 0.079   | 0.062      | 81.51                |
| 1990 | 0.043       | 0.082   | 0.065      | 91.61                |
| 1991 | 0.046       | 0.083   | 0.067      | 122.43               |
| 1992 | 0.055       | 0.098   | 0.077      | 134.51               |
| 1993 | 0.063       | 0.107   | 0.089      | 142.17               |
| 1994 | 0.052       | 0.096   | 0.077      | 157.10               |

## EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

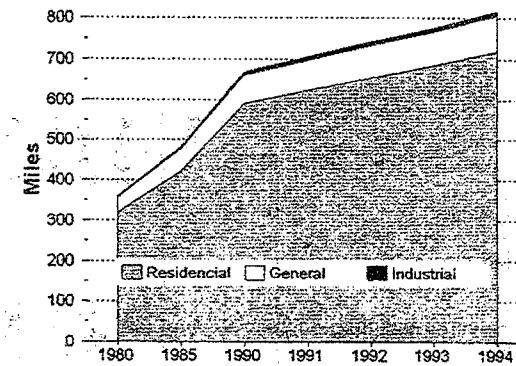
Precios corrientes.

# COSTA RICA: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

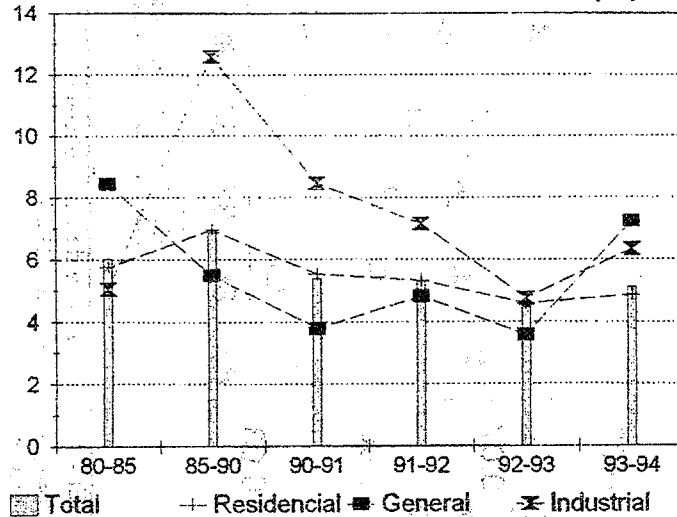
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |         |            |       | %           |         |            |       |
|------|-------|-------------|---------|------------|-------|-------------|---------|------------|-------|
|      | Total | Residencial | General | Industrial | Otros | Residencial | General | Industrial | Otros |
| 1980 | 358.2 | 318.1       | 36.5    | 3.6        | 0.0   | 88.8        | 10.2    | 1.0        | 0.0   |
| 1985 | 480.3 | 420.9       | 54.8    | 4.6        | 0.0   | 87.6        | 11.4    | 1.0        | 0.0   |
| 1990 | 669.5 | 589.6       | 71.5    | 8.3        | 0.0   | 88.1        | 10.7    | 1.2        | 0.0   |
| 1991 | 705.5 | 622.2       | 74.2    | 9.0        | 0.0   | 88.2        | 10.5    | 1.3        | 0.0   |
| 1992 | 742.8 | 655.3       | 77.8    | 9.7        | 0.0   | 88.2        | 10.5    | 1.3        | 0.0   |
| 1993 | 776.1 | 685.3       | 80.6    | 10.1       | 0.0   | 88.3        | 10.4    | 1.3        | 0.0   |
| 1994 | 815.7 | 718.5       | 86.4    | 10.8       | 0.0   | 88.1        | 10.6    | 1.3        | 0.0   |

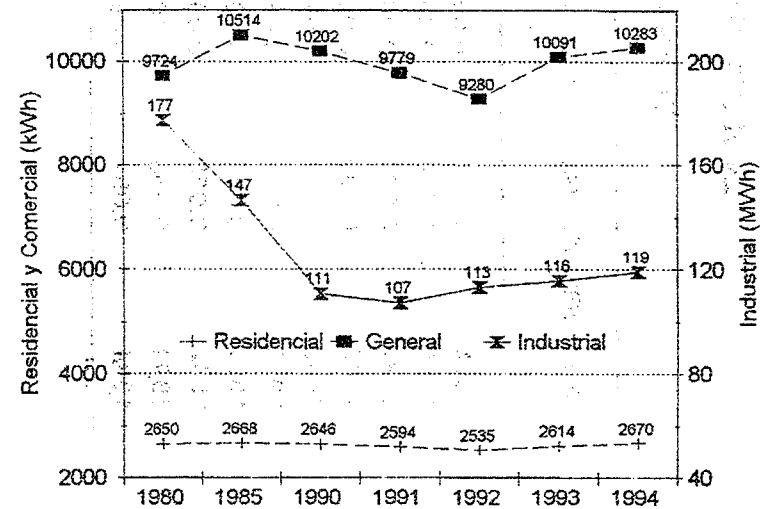
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

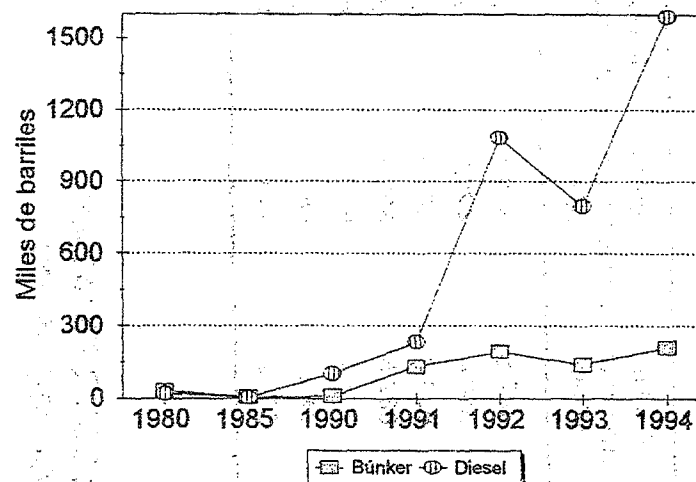
Las cifras corresponden a las ventas totales.

# COSTA RICA: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

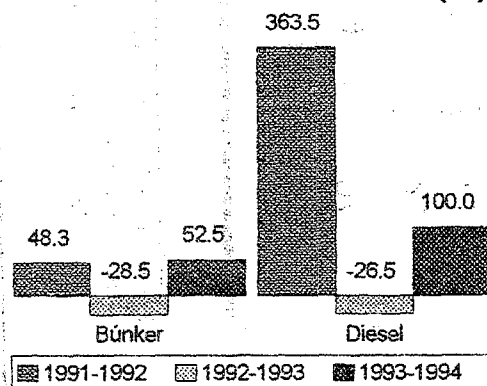
**EVOLUCION RECIENTE**  
(Miles de barriles)

| Año  | Total  | Búnker | Diesel |
|------|--------|--------|--------|
| 1980 | 51.4   | 31.5   | 19.9   |
| 1985 | 9.4    | 5.5    | 3.9    |
| 1990 | 111.9  | 10.2   | 101.8  |
| 1991 | 364.0  | 130.4  | 233.5  |
| 1992 | 1275.8 | 193.5  | 1082.3 |
| 1993 | 933.4  | 138.3  | 795.0  |
| 1994 | 1801.0 | 211.0  | 1590.0 |

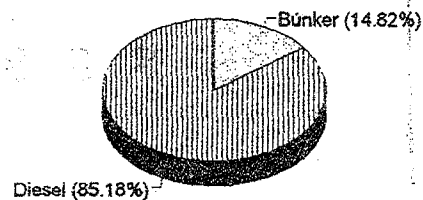
**EVOLUCION RECIENTE**



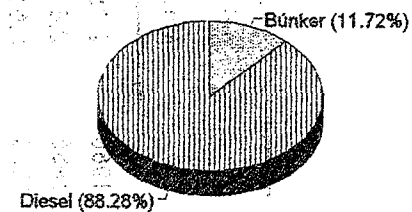
**TASAS DE CRECIMIENTO (%)**



**COMBUSTIBLE UTILIZADO, 1993**



**COMBUSTIBLE UTILIZADO, 1994**



Fuente: CEPAL, sobre la base de cifras oficiales.

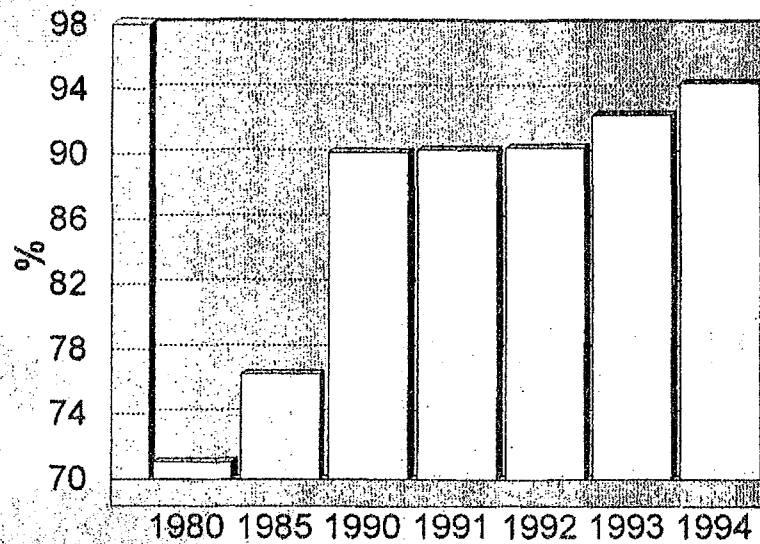
Nota: Cifras preliminares para 1994.

## COSTA RICA: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Total de<br>viviendas<br>Miles | Clientes<br>residenciales<br>Miles | Indice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|------------------------------------|-----------------------------------|
| 1980 | 2,284              | 5.1                        | 447.8                          | 318.1                              | 71.0                              |
| 1985 | 2,642              | 4.8                        | 550.4                          | 420.9                              | 76.5                              |
| 1990 | 3,010              | 4.6                        | 654.3                          | 589.6                              | 90.1                              |
| 1991 | 3,082              | 4.5                        | 689.5                          | 622.2                              | 90.2                              |
| 1992 | 3,154              | 4.4                        | 725.1                          | 655.3                              | 90.4                              |
| 1993 | 3,225              | 4.4                        | 741.4                          | 685.3                              | 92.4                              |
| 1994 | 3,296              | 4.3                        | 761.2                          | 718.5                              | 94.4                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

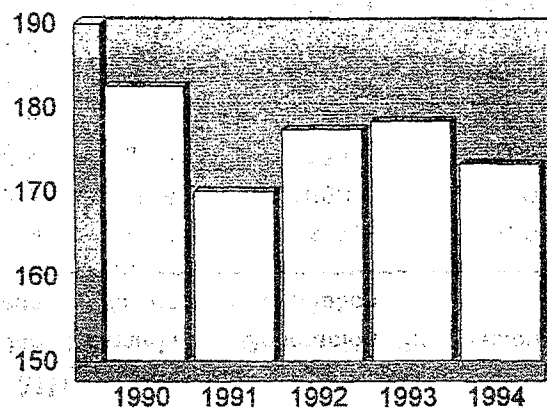
Indice de habitantes por vivienda ajustado por CEPAL.

## COSTA RICA: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

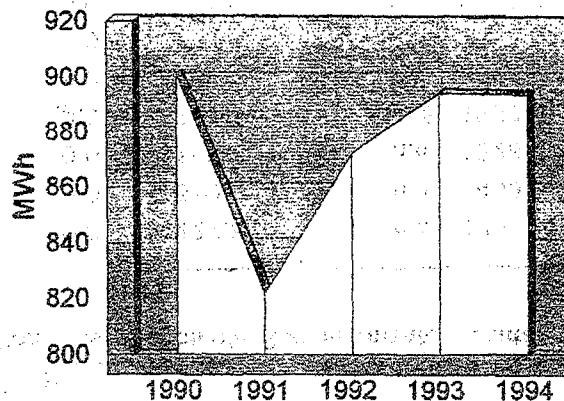
### EVOLUCIÓN RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | 4,872     |                                    | 358.2                               | 73.5                            | 1893.6              | 388.7                                     |
| 1985 | 5,247     | 1.49                               | 480.3                               | 91.5                            | 2471.6              | 471.0                                     |
| 1990 | 3,667     |                                    | 669.5                               | 182.6                           | 3304.8              | 901.2                                     |
| 1991 | 4,150     | 13.17                              | 705.5                               | 170.0                           | 3410.8              | 821.9                                     |
| 1992 | 4,187     | 0.89                               | 742.8                               | 177.4                           | 3651.5              | 872.1                                     |
| 1993 | 4,350     | 3.89                               | 776.1                               | 178.4                           | 3890.2              | 894.3                                     |
| 1994 | 4,710     | 8.28                               | 815.7                               | 173.2                           | 4208.6              | 893.5                                     |

**USUARIOS POR EMPLEADO  
EVOLUCIÓN RECIENTE**



**ENERGÍA VENDIDA POR EMPLEADO  
EVOLUCIÓN RECIENTE**



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

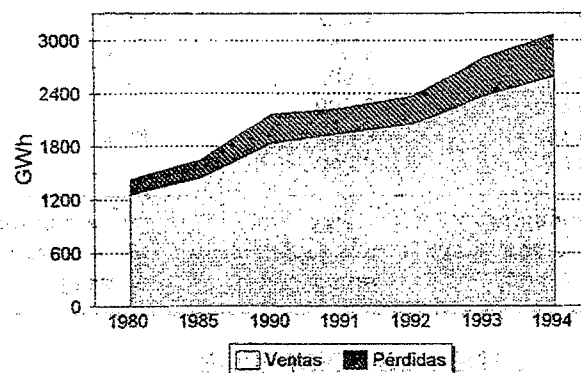
El número de empleados corresponde sólo al ICE a partir de 1990; para 1980 y 1985 la fuente es el Banco Mundial.



## EL SALVADOR: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             |               | %      |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 449.9               | 269            | 1427.8                  | 0.0         | 0.0         | 0.0     | 1427.8      | n.d.          | 1261.4 | 11.7     | 60.6            |
| 1985 | 631.8               | 318            | 1650.5                  | 0.0         | 0.0         | 0.0     | 1650.5      | n.d.          | 1439.6 | 12.8     | 59.2            |
| 1990 | 650.4               | 412            | 2164.3                  | 9.5         | 10.8        | 0.0     | 2165.7      | n.d.          | 1828.2 | 15.6     | 60.0            |
| 1991 | 650.4               | 448            | 2230.5                  | 1.7         | 6.9         | 0.0     | 2235.6      | 160.8         | 1937.8 | 13.3     | 57.0            |
| 1992 | 697.9               | 476            | 2316.5                  | 45.9        | 98.5        | 0.0     | 2369.1      | -             | 2049.7 | 13.5     | 56.8            |
| 1993 | 817.5               | 530            | 2718.4                  | 11.1        | 90.1        | 0.0     | 2797.4      | 22.1          | 2365.9 | 15.4     | 60.3            |
| 1994 | 817.5               | 566            | 3075.3                  | 43.3        | 32.0        | 0.0     | 3064.0      | 21.6          | 2590.7 | 15.4     | 61.8            |

DISTRIBUCION DE LA ENERGIA DISPONIBLE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con Guatemala.

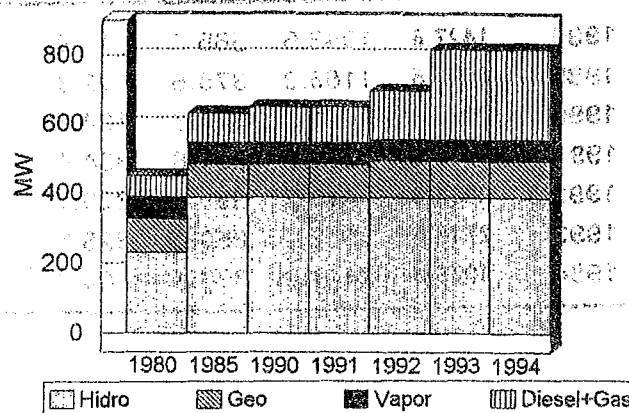
Las pérdidas corresponden a transmisión y distribución.

## EL SALVADOR: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

### EVOLUCION RECIENTE (MW)

| Año  | Total | Hidro | Geo   | Vapor | Diesel+Gas |
|------|-------|-------|-------|-------|------------|
| 1980 | 449.9 | 231.4 | 95.0  | 63.0  | 60.5       |
| 1985 | 631.8 | 388.0 | 95.0  | 63.0  | 85.8       |
| 1990 | 650.4 | 388.0 | 95.0  | 63.0  | 104.4      |
| 1991 | 650.4 | 388.0 | 95.0  | 63.0  | 104.4      |
| 1992 | 697.9 | 388.0 | 105.0 | 63.0  | 141.9      |
| 1993 | 817.5 | 388.0 | 105.0 | 63.0  | 261.5      |
| 1994 | 817.5 | 388.0 | 105.0 | 63.0  | 261.5      |

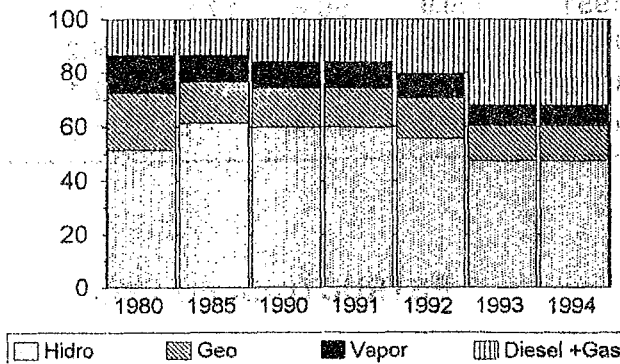
### EVOLUCION RECIENTE



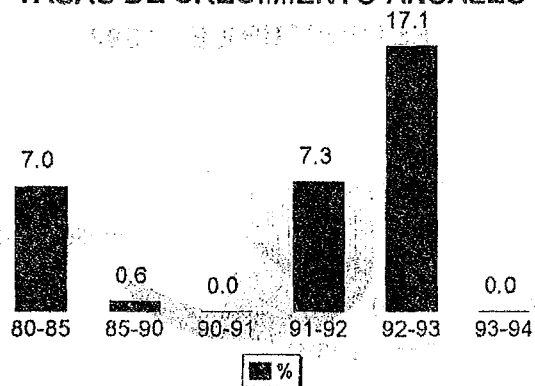
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo  | Vapor | Diesel+Gas |
|------|-------|-------|------|-------|------------|
| 1980 | 100.0 | 51.4  | 21.1 | 14.0  | 13.4       |
| 1985 | 100.0 | 61.4  | 15.0 | 10.0  | 13.6       |
| 1990 | 100.0 | 59.7  | 14.6 | 9.7   | 16.1       |
| 1991 | 100.0 | 59.7  | 14.6 | 9.7   | 16.1       |
| 1992 | 100.0 | 55.6  | 15.0 | 9.0   | 20.3       |
| 1993 | 100.0 | 47.5  | 12.8 | 7.7   | 32.0       |
| 1994 | 100.0 | 47.5  | 12.8 | 7.7   | 32.0       |

### ESTRUCTURA (%)



### TASAS DE CRECIMIENTO ANUALES



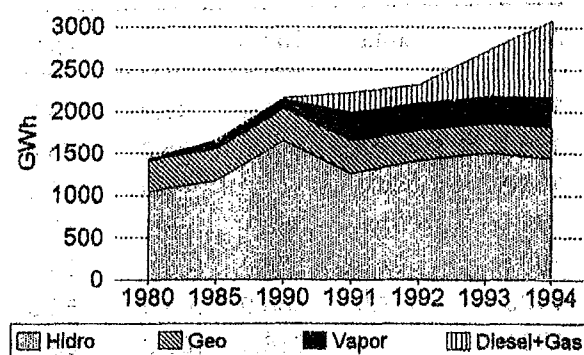
Fuente: CEPAL, sobre la base de cifras oficiales.  
 Nota: Cifras preliminares para 1994.

## EL SALVADOR: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro  | Geo   | Vapor | Diesel+Gas |
|------|--------|--------|-------|-------|------------|
| 1980 | 1427.8 | 1043.5 | 365.3 | 13.9  | 5.1        |
| 1985 | 1650.5 | 1165.8 | 379.6 | 72.3  | 32.7       |
| 1990 | 2164.3 | 1641.5 | 384.3 | 124.9 | 13.7       |
| 1991 | 2230.5 | 1262.5 | 391.6 | 334.4 | 241.9      |
| 1992 | 2316.5 | 1410.2 | 359.2 | 329.1 | 217.9      |
| 1993 | 2718.4 | 1512.0 | 350.5 | 328.5 | 527.4      |
| 1994 | 3075.3 | 1441.9 | 373.1 | 364.7 | 895.5      |

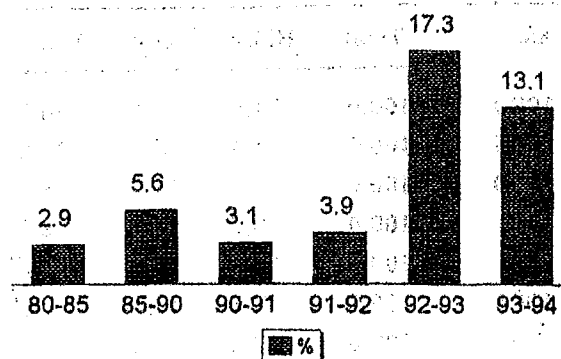
### EVOLUCION RECIENTE



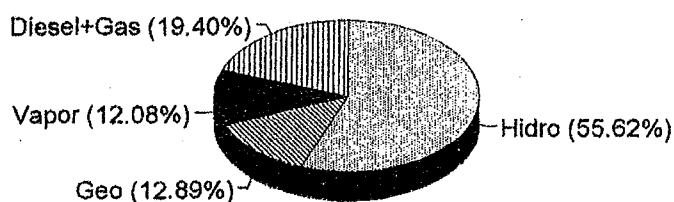
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo  | Vapor | Diesel+Gas |
|------|-------|-------|------|-------|------------|
| 1980 | 100.0 | 73.1  | 25.6 | 1.0   | 0.4        |
| 1985 | 100.0 | 70.6  | 23.0 | 4.4   | 2.0        |
| 1990 | 100.0 | 75.8  | 17.8 | 5.8   | 0.6        |
| 1991 | 100.0 | 56.6  | 17.6 | 15.0  | 10.8       |
| 1992 | 100.0 | 60.9  | 15.5 | 14.2  | 9.4        |
| 1993 | 100.0 | 55.6  | 12.9 | 12.1  | 19.4       |
| 1994 | 100.0 | 46.9  | 12.1 | 11.9  | 29.1       |

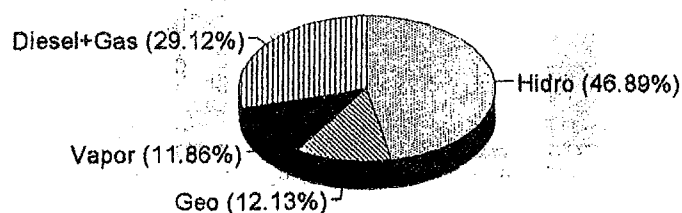
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## EL SALVADOR: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        |
| <b>Sistema Integrado</b> | <b>32</b>          | <b>817,500</b>          | <b>2,782,678.2</b> | <b>64,314.3</b> | <b>2,718,363.9</b> | <b>47,818.6</b>            | <b>31,368.8</b> |
| <b>Hidráulica</b>        | <b>10</b>          | <b>388,000</b>          | <b>1,518,090.3</b> | <b>6,085.6</b>  | <b>1,512,004.7</b> |                            |                 |
| 15 Septiembre            | 2                  | 156,600                 | 557,303.0          | 2,217.5         | 555,085.5          |                            |                 |
| Cerrón Grande            | 2                  | 135,000                 | 433,428.0          | 990.7           | 432,437.3          |                            |                 |
| 5 de Noviembre           | 5                  | 81,400                  | 473,054.8          | 2,431.8         | 470,623.0          |                            |                 |
| Guajoyo                  | 1                  | 15,000                  | 54,304.5           | 445.6           | 53,858.9           |                            |                 |
| <b>Geotérmica</b>        | <b>5</b>           | <b>105,000</b>          | <b>379,641.6</b>   | <b>29,129.3</b> | <b>350,512.3</b>   |                            |                 |
| Ahuachapán               | 3                  | 95,000                  | 362,195.8          | 29,014.2        | 333,181.6          |                            |                 |
| Berlín                   | 2                  | 10,000                  | 17,445.8           | 115.1           | 17,330.7           |                            |                 |
| <b>Vapor</b>             | <b>2</b>           | <b>63,000</b>           | <b>354,493.1</b>   | <b>26,023.2</b> | <b>328,469.9</b>   | <b>23.2</b>                | <b>30,729.0</b> |
| Acajutla (Vapor)         | 2                  | 63,000                  | 354,493.1          | 26,023.2        | 328,469.9          | 23.2                       | 30,729.0        |
| <b>Diesel</b>            | <b>3</b>           | <b>18,600</b>           | <b>9,380.0</b>     | <b>571.3</b>    | <b>8,808.7</b>     | <b>21.2</b>                | <b>639.8</b>    |
| Miravalles               | 3                  | 18,600                  | 9,380.0            | 571.3           | 8,808.7            | 21.2                       | 639.8           |
| <b>Turbogas</b>          | <b>12</b>          | <b>242,900</b>          | <b>521,073.2</b>   | <b>2,504.9</b>  | <b>518,568.3</b>   | <b>47,774.2</b>            |                 |
| Acajutla (Gas)           | 3                  | 157,100                 | 482,463.0          | 2,362.8         | 480,100.2          | 43,986.6                   |                 |
| Soyapango                | 3                  | 53,900                  |                    |                 |                    |                            |                 |
| San Miguel               | 6                  | 31,900                  | 38,610.2           | 142.1           | 38,468.1           | 3,787.6                    |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.

## EL SALVADOR: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        |
| <b>Sistema Integrado</b> | <b>32</b>          | <b>817,500</b>          | <b>3,145,942.7</b> | <b>70,673.5</b> | <b>3,075,269.2</b> | <b>81,698.2</b>            | <b>34,155.4</b> |
| <b>Hidráulica</b>        | <b>10</b>          | <b>388,000</b>          | <b>1,447,571.8</b> | <b>5,669.2</b>  | <b>1,441,902.6</b> |                            |                 |
| 15 Septiembre            | 2                  | 156,600                 | 513,109.0          | 1,875.9         | 511,233.1          |                            |                 |
| Cerrón Grande            | 2                  | 135,000                 | 396,745.0          | 1,016.3         | 395,728.7          |                            |                 |
| 5 de Noviembre           | 5                  | 81,400                  | 485,573.8          | 2,213.0         | 483,360.8          |                            |                 |
| Guajoyo                  | 1                  | 15,000                  | 52,144.0           | 564.0           | 51,580.0           |                            |                 |
| <b>Geotérmica</b>        | <b>5</b>           | <b>105,000</b>          | <b>406,688.7</b>   | <b>33,570.3</b> | <b>373,118.4</b>   |                            |                 |
| Ahuachapán               | 3                  | 95,000                  | 370,787.8          | 33,290.5        | 337,497.3          |                            |                 |
| Berlín                   | 2                  | 10,000                  | 35,900.9           | 279.8           | 35,621.1           |                            |                 |
| <b>Vapor</b>             | <b>2</b>           | <b>63,000</b>           | <b>392,642.0</b>   | <b>27,902.5</b> | <b>364,739.5</b>   | <b>19.4</b>                | <b>33,133.3</b> |
| Acajutla (Vapor)         | 2                  | 63,000                  | 392,642.0          | 27,902.5        | 364,739.5          | 19.4                       | 33,133.3        |
| <b>Diesel</b>            | <b>3</b>           | <b>18,600</b>           | <b>14,753.5</b>    | <b>805.2</b>    | <b>13,948.3</b>    | <b>37.0</b>                | <b>1,022.1</b>  |
| Miravalles               | 3                  | 18,600                  | 14,753.5           | 805.2           | 13,948.3           | 37.0                       | 1,022.1         |
| <b>Turbogas</b>          | <b>12</b>          | <b>242,900</b>          | <b>884,286.7</b>   | <b>2,726.3</b>  | <b>881,560.4</b>   | <b>81,641.8</b>            |                 |
| Acajutla (Gas)           | 3                  | 157,100                 | 757,009.4          | 2,129.4         | 754,880.0          | 68,388.6                   |                 |
| Soyapango                | 3                  | 53,900                  | 28,433.8           | 305.9           | 28,127.9           | 2,880.2                    |                 |
| San Miguel               | 6                  | 31,900                  | 98,843.5           | 291.0           | 98,552.5           | 10,373.0                   |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.

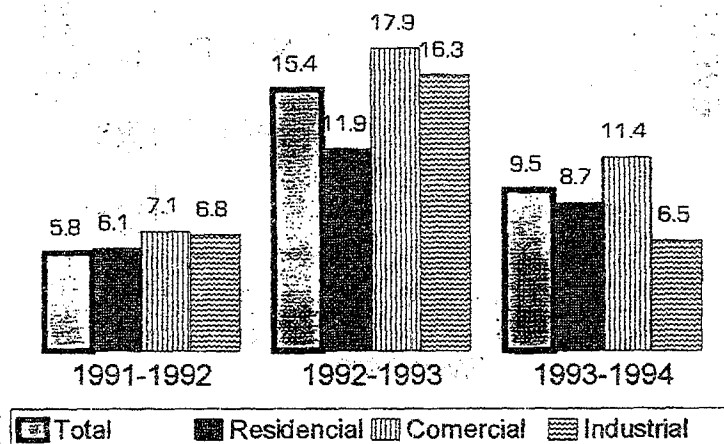
Nota: Cifras preliminares.

## EL SALVADOR: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

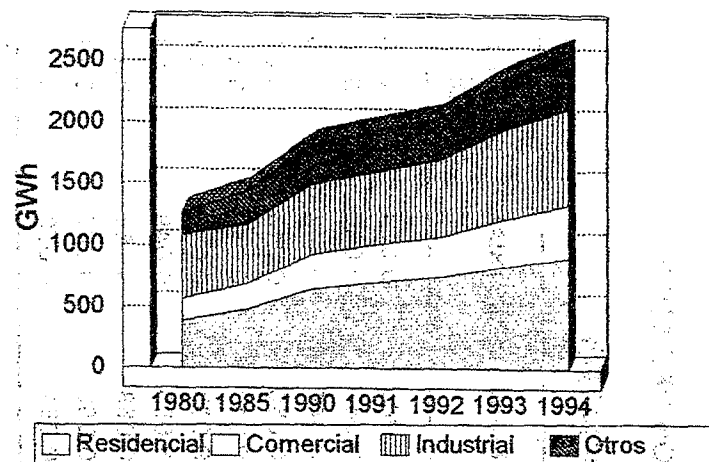
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | Comercial | Industrial | Otros |
|------|--------|-------------|-----------|------------|-------|
| 1980 | 1261.4 | 386.0       | 177.6     | 516.0      | 181.8 |
| 1985 | 1439.6 | 476.9       | 213.1     | 479.6      | 270.0 |
| 1990 | 1828.2 | 651.4       | 277.0     | 569.7      | 330.2 |
| 1991 | 1937.8 | 706.9       | 303.7     | 588.0      | 339.2 |
| 1992 | 2049.7 | 749.8       | 325.1     | 628.2      | 346.6 |
| 1993 | 2365.9 | 839.1       | 383.2     | 730.5      | 413.1 |
| 1994 | 2590.7 | 912.3       | 427.0     | 778.0      | 473.3 |

### TASAS DE CRECIMIENTO (%)



### EVOLUCION RECIENTE



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 30.6        | 14.1      | 40.9       | 14.4  |
| 1985 | 100.0 | 33.1        | 14.8      | 33.3       | 18.8  |
| 1990 | 100.0 | 35.6        | 15.2      | 31.2       | 18.1  |
| 1991 | 100.0 | 36.5        | 15.7      | 30.3       | 17.5  |
| 1992 | 100.0 | 36.6        | 15.9      | 30.7       | 16.9  |
| 1993 | 100.0 | 35.5        | 16.2      | 30.9       | 17.5  |
| 1994 | 100.0 | 35.2        | 16.5      | 30.0       | 18.3  |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

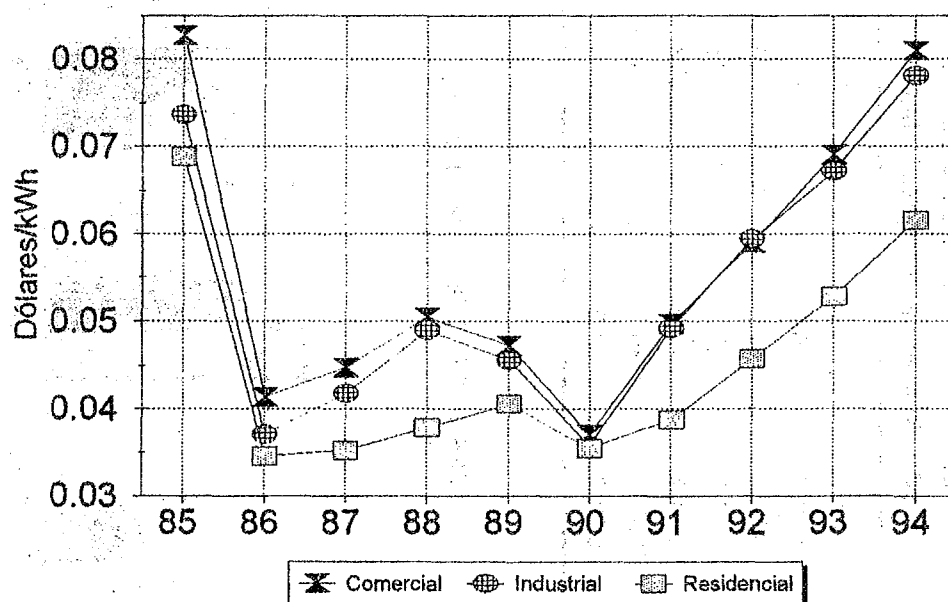
## EL SALVADOR: PRECIOS PROMEDIO

### EVOLUCION RECIENTE

Dólares/kWh

| AÑO  | RESIDENCIAL | COMERCIAL | INDUSTRIAL | COLONES<br>POR DOLAR |
|------|-------------|-----------|------------|----------------------|
| 1985 | 0.069       | 0.083     | 0.074      | 2.50                 |
| 1986 | 0.035       | 0.041     | 0.037      | 5.00                 |
| 1987 | 0.035       | 0.045     | 0.042      | 5.00                 |
| 1988 | 0.038       | 0.050     | 0.049      | 5.00                 |
| 1989 | 0.041       | 0.047     | 0.046      | 5.48                 |
| 1990 | 0.035       | 0.037     | 0.036      | 7.67                 |
| 1991 | 0.039       | 0.050     | 0.049      | 8.08                 |
| 1992 | 0.046       | 0.059     | 0.059      | 8.44                 |
| 1993 | 0.053       | 0.069     | 0.067      | 8.78                 |
| 1994 | 0.062       | 0.081     | 0.078      | 8.78                 |

### EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

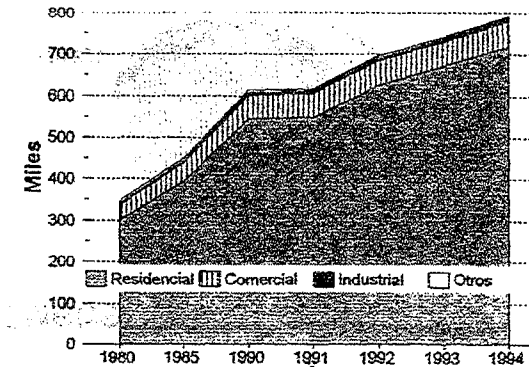
Precios corrientes.

# EL SALVADOR: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

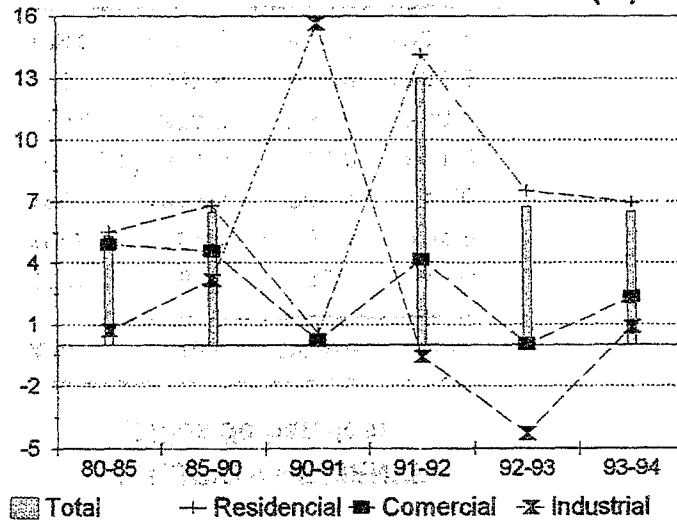
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |           |            |       | %           |           |            |       |
|------|-------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 345.3 | 299.3       | 35.7      | 5.0        | 5.3   | 86.7        | 10.4      | 1.4        | 1.5   |
| 1985 | 447.8 | 391.9       | 45.4      | 5.1        | 5.4   | 87.5        | 10.1      | 1.1        | 1.2   |
| 1990 | 613.1 | 544.7       | 56.8      | 6.0        | 5.6   | 88.9        | 9.3       | 1.0        | 0.9   |
| 1991 | 616.3 | 547.8       | 56.9      | 7.0        | 4.7   | 88.9        | 9.2       | 1.1        | 0.8   |
| 1992 | 696.6 | 625.4       | 59.3      | 6.9        | 5.0   | 89.8        | 8.5       | 1.0        | 0.7   |
| 1993 | 743.6 | 672.6       | 59.3      | 6.6        | 5.1   | 90.5        | 8.0       | 0.9        | 0.7   |
| 1994 | 792.1 | 719.5       | 60.6      | 6.7        | 5.2   | 90.8        | 7.7       | 0.8        | 0.7   |

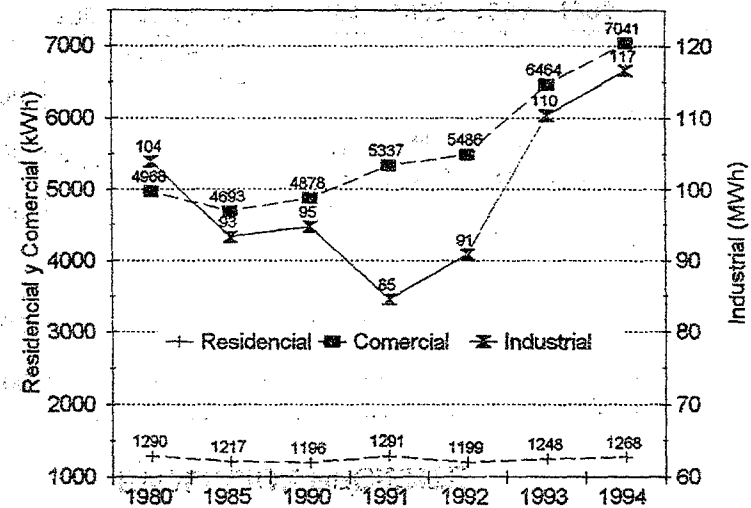
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

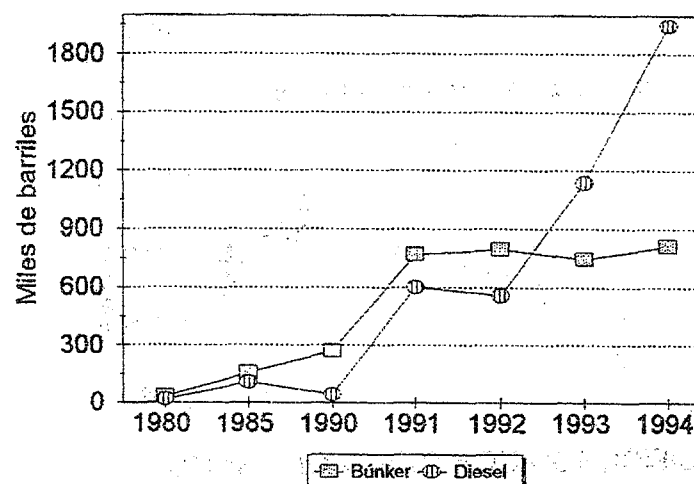


# EL SALVADOR: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

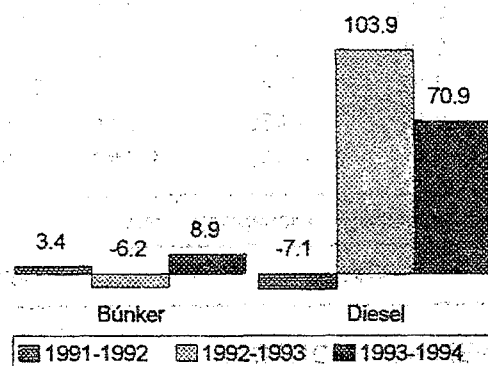
## EVOLUCION RECIENTE (Miles de barriles)

| Año  | Total  | Búnker | Diesel |
|------|--------|--------|--------|
| 1980 | 50.1   | 32.6   | 17.5   |
| 1985 | 259.7  | 154.8  | 104.9  |
| 1990 | 311.1  | 269.1  | 42.0   |
| 1991 | 1371.3 | 770.3  | 601.0  |
| 1992 | 1354.7 | 796.3  | 558.4  |
| 1993 | 1885.4 | 746.9  | 1138.5 |
| 1994 | 2758.4 | 813.2  | 1945.2 |

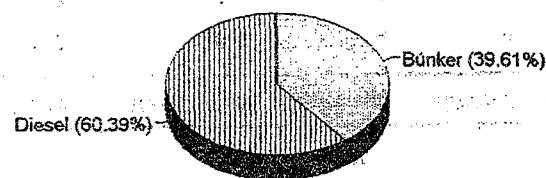
## EVOLUCION RECIENTE



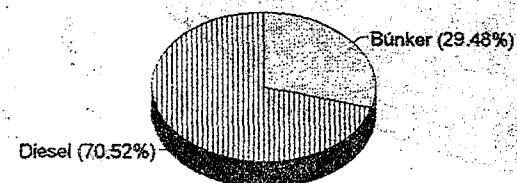
## TASAS DE CRECIMIENTO (%)



## COMBUSTIBLE UTILIZADO, 1993



## COMBUSTIBLE UTILIZADO, 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

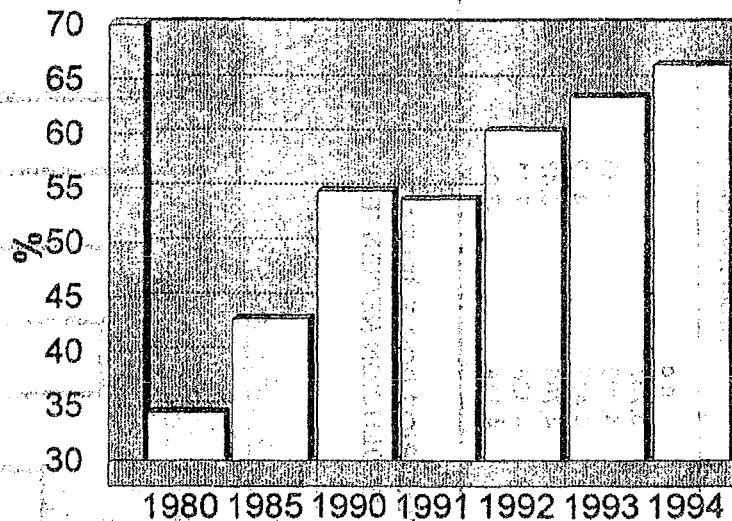
Nota: Cifras preliminares para 1994.

## EL SALVADOR: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Tótal de<br>viviendas<br>Miles | Cientes<br>residenciales<br>Miles | Índice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|-----------------------------------|-----------------------------------|
| 1980 | 4,525              | 5.2                        | 870.2                          | 299.3                             | 34.4                              |
| 1985 | 4,739              | 5.2                        | 911.3                          | 391.9                             | 43.0                              |
| 1990 | 5,172              | 5.2                        | 994.6                          | 544.7                             | 54.8                              |
| 1991 | 5,279              | 5.2                        | 1015.2                         | 547.8                             | 54.0                              |
| 1992 | 5,396              | 5.2                        | 1037.7                         | 625.4                             | 60.3                              |
| 1993 | 5,517              | 5.2                        | 1061.0                         | 672.6                             | 63.4                              |
| 1994 | 5,641              | 5.2                        | 1084.8                         | 719.5                             | 66.3                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

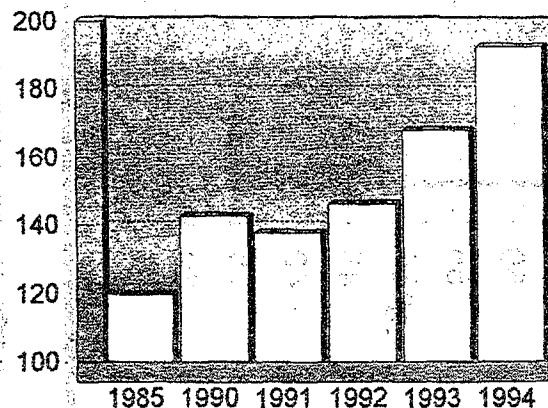
Nota: Cifras preliminares para 1994.

## EL SALVADOR: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

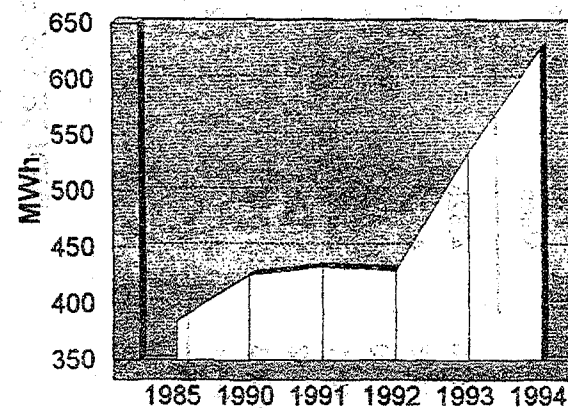
### EVOLUCION RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | n.d.      |                                    | 345.3                               |                                 | 1261.4              |   |
| 1985 | 3,737     |                                    | 447.8                               | 119.8                           | 1439.6              | 385.2                                     |
| 1990 | 4,300     | 2.85                               | 613.1                               | 142.6                           | 1828.2              | 425.2                                     |
| 1991 | 4,477     | 4.12                               | 616.3                               | 137.7                           | 1937.8              | 432.8                                     |
| 1992 | 4,765     | 6.43                               | 696.6                               | 146.2                           | 2049.7              | 430.2                                     |
| 1993 | 4,426     | -7.11                              | 743.6                               | 168.0                           | 2365.9              | 534.5                                     |
| 1994 | 4,114     | -7.05                              | 792.1                               | 192.5                           | 2590.7              | 629.7                                     |

**USUARIOS POR EMPLEADO  
EVOLUCION RECIENTE**



**ENERGIA VENDIDA POR EMPLEADO  
EVOLUCION RECIENTE**



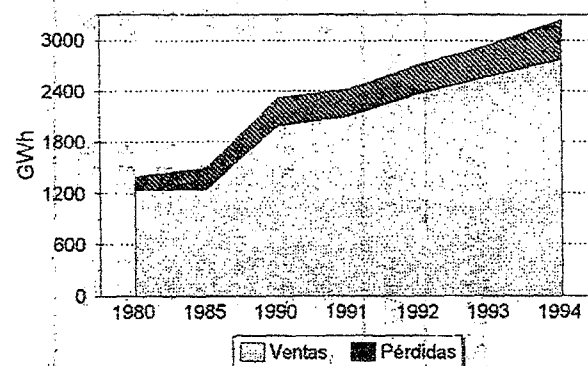
Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## GUATEMALA: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             | %             |        |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 366.5               | 273            | 1391.4                  | 0.0         | 0.0         | 0.0     | 1391.4      | n.d.          | 1235.7 | 11.2     | 58.2            |
| 1985 | 783.4               | 302            | 1493.1                  | 0.0         | 0.0         | 0.0     | 1493.1      | n.d.          | 1245.0 | 16.6     | 56.4            |
| 1990 | 810.9               | 452            | 2318.4                  | 10.8        | 9.5         | 0.0     | 2317.1      | n.d.          | 1989.4 | 14.1     | 58.5            |
| 1991 | 850.4               | 495            | 2419.7                  | 6.8         | 1.7         | 10.0    | 2424.6      | 43.0          | 2102.4 | 13.3     | 55.9            |
| 1992 | 928.2               | 538            | 2748.6                  | 89.3        | 34.9        | 17.7    | 2711.9      | -             | 2370.0 | 12.6     | 57.5            |
| 1993 | 993.3               | 579            | 2366.7                  | 90.1        | 10.9        | 663.8   | 2951.3      | -             | 2571.3 | 12.9     | 58.2            |
| 1994 | 1030.8              | 624            | 2301.1                  | 30.8        | 42.0        | 924.4   | 3236.7      | 9.0           | 2769.8 | 14.4     | 59.2            |

DISTRIBUCION DE LA ENERGIA DISPONIBLE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con El Salvador.

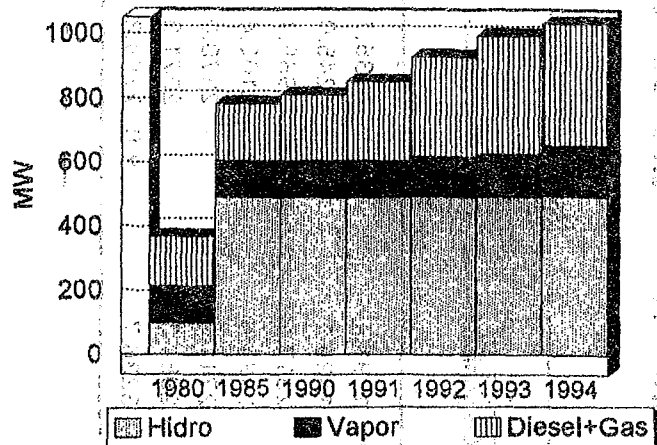
Las pérdidas corresponden a transmisión y distribución.

## GUATEMALA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

### EVOLUCION RECIENTE (MW)

| Año  | Total  | Hidro | Vapor | Diesel+ Gas |
|------|--------|-------|-------|-------------|
| 1980 | 366.5  | 97.7  | 116.0 | 152.8       |
| 1985 | 783.4  | 488.1 | 116.0 | 179.3       |
| 1990 | 810.9  | 488.1 | 116.0 | 206.8       |
| 1991 | 850.4  | 488.1 | 116.0 | 246.3       |
| 1992 | 928.2  | 490.1 | 126.9 | 311.2       |
| 1993 | 993.3  | 490.1 | 137.0 | 366.2       |
| 1994 | 1030.8 | 492.1 | 160.5 | 378.2       |

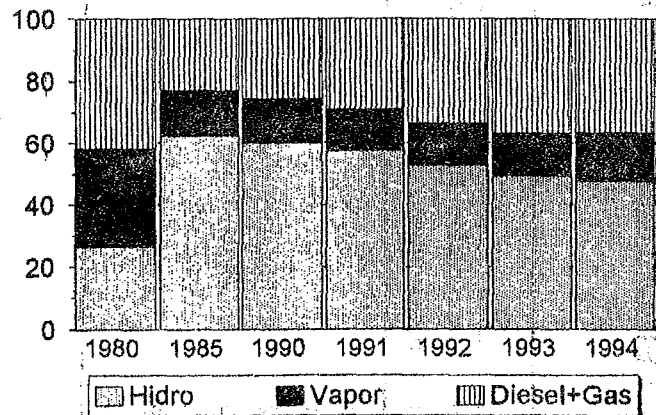
### EVOLUCION RECIENTE



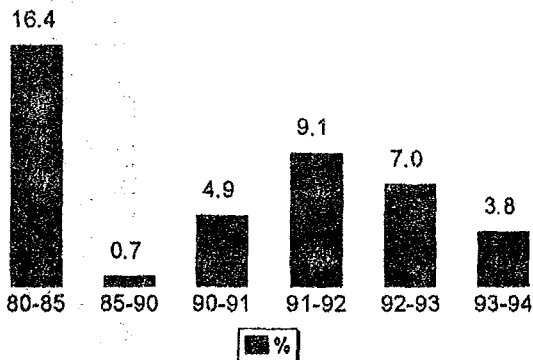
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+ Gas |
|------|-------|-------|-------|-------------|
| 1980 | 100.0 | 26.7  | 31.7  | 41.7        |
| 1985 | 100.0 | 62.3  | 14.8  | 22.9        |
| 1990 | 100.0 | 60.2  | 14.3  | 25.5        |
| 1991 | 100.0 | 57.4  | 13.6  | 29.0        |
| 1992 | 100.0 | 52.8  | 13.7  | 33.5        |
| 1993 | 100.0 | 49.3  | 13.8  | 36.9        |
| 1994 | 100.0 | 47.7  | 15.6  | 36.7        |

### ESTRUCTURA (%)



### TASAS DE CRECIMIENTO ANUALES



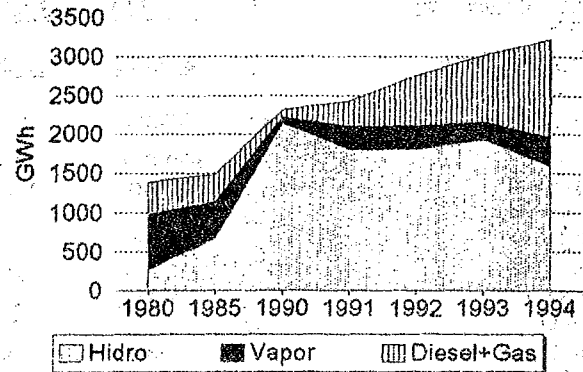
Fuente: CEPAL, sobre la base de cifras oficiales.  
 Nota: Cifras preliminares para 1994.

## GUATEMALA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro  | Vapor | Diesel+Gas |
|------|--------|--------|-------|------------|
| 1980 | 1391.4 | 277.6  | 700.9 | 412.9      |
| 1985 | 1493.1 | 675.2  | 467.5 | 350.5      |
| 1990 | 2318.4 | 2140.6 | 81.2  | 96.6       |
| 1991 | 2429.7 | 1804.3 | 287.3 | 338.1      |
| 1992 | 2766.4 | 1813.2 | 288.5 | 664.7      |
| 1993 | 3030.5 | 1934.4 | 224.1 | 872.1      |
| 1994 | 3225.5 | 1597.8 | 349.3 | 1278.4     |

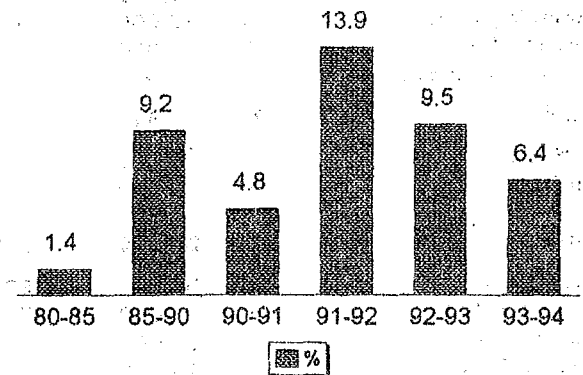
### EVOLUCION RECIENTE



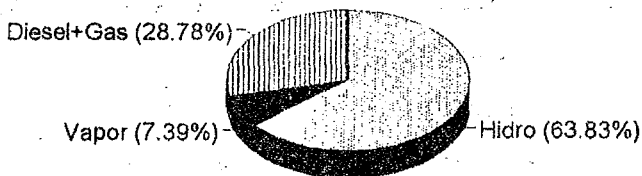
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 100.0 | 20.0  | 50.4  | 29.7       |
| 1985 | 100.0 | 45.2  | 31.3  | 23.5       |
| 1990 | 100.0 | 92.3  | 3.5   | 4.2        |
| 1991 | 100.0 | 74.3  | 11.8  | 13.9       |
| 1992 | 100.0 | 65.5  | 10.4  | 24.0       |
| 1993 | 100.0 | 63.8  | 7.4   | 28.8       |
| 1994 | 100.0 | 49.5  | 10.8  | 39.6       |

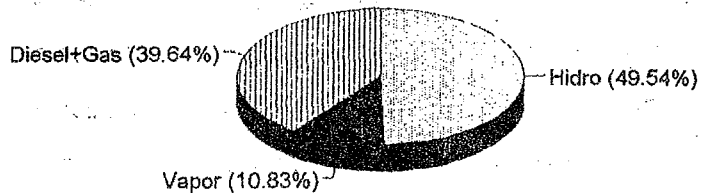
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

REPUBLICA DE GUATEMALA  
GUATEMALA: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        | Crudo           |
| <b>Sistema Integrado</b> | <b>71</b>          | <b>993,320</b>          | <b>3,050,633.2</b> | <b>20,103.9</b> | <b>3,030,529.3</b> | <b>21,738.9</b>            | <b>54,738.4</b> | <b>10,945.0</b> |
| <b>Sistema Público</b>   | <b>51</b>          | <b>863,320</b>          | <b>2,386,827.8</b> | <b>20,103.9</b> | <b>2,366,723.9</b> | <b>21,738.9</b>            | <b>10,911.4</b> | <b>10,945.0</b> |
| <b>Hidráulica</b>        | <b>28</b>          | <b>488,080</b>          | <b>1,921,817.8</b> | <b>6,911.3</b>  | <b>1,914,906.5</b> |                            |                 |                 |
| Chixoy                   | 5                  | 300,000                 | 1,384,468.9        | 3,366.9         | 1,381,102.0        |                            |                 |                 |
| Aguacapa                 | 3                  | 90,000                  | 266,354.0          | 2,737.9         | 263,616.1          |                            |                 |                 |
| Jurón Marina             | 3                  | 60,000                  | 149,875.0          | 531.1           | 149,343.9          |                            |                 |                 |
| Esclavos                 | 2                  | 13,500                  | 46,081.8           | 143.7           | 45,938.1           |                            |                 |                 |
| Santa María              | 3                  | 6,880                   | 31,240.0           | 19.0            | 31,221.0           |                            |                 |                 |
| El Salto                 | 2                  | 5,500                   | 8,407.2            | 24.2            | 8,383.0            |                            |                 |                 |
| San Luis                 | 2                  | 5,000                   |                    |                 |                    |                            |                 |                 |
| Río Hondo                | 2                  | 2,400                   | 15,274.6           | 14.7            | 15,259.9           |                            |                 |                 |
| El Porvenir              | 1                  | 2,280                   | 12,515.1           | 14.5            | 12,500.6           |                            |                 |                 |
| Palín                    | 3                  | 1,820                   | 4,094.2            | 59.3            | 4,034.9            |                            |                 |                 |
| Chichaic                 | 2                  | 700                     | 3,507.0            |                 | 3,507.0            |                            |                 |                 |
| <b>Vapor</b>             | <b>6</b>           | <b>119,000</b>          | <b>202,757.6</b>   | <b>10,886.1</b> | <b>191,871.5</b>   | <b>8,386.7</b>             | <b>10,911.4</b> | <b>10,945.0</b> |
| Escuintla Vapor II       | 1                  | 53,000                  | 99,124.1           | 5,732.8         | 93,391.3           | 86.7                       | 8,208.4         |                 |
| Laguna Vapor EEGSA       | 4                  | 33,000                  | 103,633.5          | 5,153.3         | 98,480.2           |                            |                 |                 |
| Escuintla Vapor I        | 1                  | 33,000                  |                    |                 |                    |                            |                 |                 |
| Total Combustibles EEGSA |                    |                         |                    |                 |                    | 8,300.0                    | 2,703.0         | 10,945.0        |
| <b>Diesel</b>            | <b>7</b>           | <b>6,840</b>            | <b>959.1</b>       | <b>73.3</b>     | <b>885.8</b>       | <b>86.1</b>                | <b>0.0</b>      | <b>0.0</b>      |
| Puerto Barrios           | 6                  | 5,400                   | 903.1              | 72.2            | 830.9              | 82.0                       |                 |                 |
| San Felipe               | 1                  | 1,440                   | 56.0               | 1.1             | 54.9               | 4.1                        |                 |                 |
| <b>Turbogas</b>          | <b>10</b>          | <b>249,400</b>          | <b>261,293.3</b>   | <b>2,233.2</b>  | <b>259,060.1</b>   | <b>13,266.1</b>            | <b>0.0</b>      | <b>0.0</b>      |
| Escuintla Gas VI         | 1                  | 50,000                  | 93,144.0           | 1,219.6         | 91,924.4           | 7,185.7                    |                 |                 |
| Laguna Gas 4 EEGSA       | 1                  | 33,000                  | 71,300.0           | 803.9           | 70,496.1           |                            |                 |                 |
| Escuintla Gas V          | 1                  | 32,000                  | 6,443.0            |                 | 6,443.0            | 718.1                      |                 |                 |
| Escuintla Gas IV         | 1                  | 25,000                  | 38,543.0           | 126.4           | 38,416.6           | 3,833.9                    |                 |                 |
| Escuintla Gas III        | 1                  | 25,000                  | 11,698.0           | 69.5            | 11,628.5           | 1,215.3                    |                 |                 |
| Laguna Gas 3 EEGSA       | 1                  | 23,450                  | 21,831.0           | 1.3             | 21,829.7           |                            |                 |                 |
| Laguna Gas 2 EEGSA       | 1                  | 23,450                  | 15,943.0           | 2.6             | 15,940.4           |                            |                 |                 |
| Escuintla Gas II         | 1                  | 12,500                  | 2,391.3            | 9.9             | 2,381.4            | 313.1                      |                 |                 |
| Escuintla Gas I          | 1                  | 12,500                  |                    |                 |                    |                            |                 |                 |
| Laguna Gas 1 EEGSA       | 1                  | 12,500                  |                    |                 |                    |                            |                 |                 |
| <b>Sistema Privado</b>   | <b>20</b>          | <b>130,000.0</b>        | <b>663,805.4</b>   | <b>0.0</b>      | <b>663,805.4</b>   | <b>0.0</b>                 | <b>43,827.0</b> | <b>0.0</b>      |
| Cogeneración Hidro       |                    | 2,000                   | 19,450.0           |                 | 19,450.0           |                            |                 |                 |
| Cogeneración Térmica     |                    | 18,000                  | 32,232.8           |                 | 32,232.8           |                            | 1,611.6         |                 |
| Barcaza ENRON            | 20                 | 110,000                 | 612,122.6          |                 | 612,122.6          |                            | 42,215.4        |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Consumo de combustible estimado para las centrales privadas.

## GUATEMALA: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        | Crudo           |
| <b>Sistema Integrado</b> | <b>85</b>          | <b>1,030,820</b>        | <b>3,256,839.7</b> | <b>31,325.5</b> | <b>3,225,514.2</b> | <b>41,495.8</b>            | <b>74,427.0</b> | <b>18,665.5</b> |
| <b>Sistema Público</b>   | <b>50</b>          | <b>813,320</b>          | <b>2,331,777.8</b> | <b>30,693.7</b> | <b>2,301,084.1</b> | <b>33,974.8</b>            | <b>19,109.0</b> | <b>18,665.5</b> |
| <b>Hidráulica</b>        | <b>28</b>          | <b>488,080</b>          | <b>1,593,278.5</b> | <b>6,926.1</b>  | <b>1,586,352.4</b> |                            |                 |                 |
| Chixoy                   | 5                  | 300,000                 | 1,117,353.4        | 2,966.4         | 1,114,387.0        |                            |                 |                 |
| Aguacapa                 | 3                  | 90,000                  | 233,470.0          | 3,088.6         | 230,381.4          |                            |                 |                 |
| Jurún Marina             | 3                  | 60,000                  | 143,325.0          | 610.2           | 142,714.8          |                            |                 |                 |
| Esclavos                 | 2                  | 13,500                  | 37,416.6           | 156.9           | 37,259.6           |                            |                 |                 |
| Michatoyas               | 7                  | 12,320                  | 7,758.9            | 49.0            | 7,709.9            |                            |                 |                 |
| Santa María              | 3                  | 6,880                   | 26,599.7           | 19.2            | 26,580.5           |                            |                 |                 |
| Río Hondo                | 2                  | 2,400                   | 12,112.6           | 13.1            | 12,099.4           |                            |                 |                 |
| El Porvenir              | 1                  | 2,280                   | 11,984.7           | 22.7            | 11,962.0           |                            |                 |                 |
| Chichaic                 | 2                  | 700                     | 3,257.8            |                 | 3,257.8            |                            |                 |                 |
| <b>Vapor</b>             | <b>6</b>           | <b>119,000</b>          | <b>330,053.1</b>   | <b>22,316.0</b> | <b>307,737.1</b>   | <b>16,171.5</b>            | <b>19,109.0</b> | <b>18,665.5</b> |
| Escuintla Vapor II       | 1                  | 53,000                  | 211,287.0          | 16,210.0        | 195,077.0          | 13.1                       | 18,091.0        | 0.0             |
| Laguna Vapor EEGSA       | 4                  | 33,000                  | 118,766.1          | 6,106.0         | 112,660.1          |                            |                 | 0.0             |
| Escuintla Vapor I        | 1                  | 33,000                  |                    |                 |                    |                            |                 | 0.0             |
| Total Combustibles EEGSA |                    |                         |                    |                 |                    | 16,158.4                   | 1,018.0         | 18,665.5        |
| <b>Diesel</b>            | <b>7</b>           | <b>6,840</b>            | <b>1,634.3</b>     | <b>69.6</b>     | <b>1,564.7</b>     | <b>147.6</b>               | <b>0.0</b>      | <b>0.0</b>      |
| Puerto Barrios           | 6                  | 5,400                   | 1,634.3            | 69.6            | 1,564.7            | 147.6                      |                 | 0.0             |
| San Felipe               | 1                  | 1,440                   |                    |                 |                    |                            |                 | 0.0             |
| <b>Turbogas</b>          | <b>9</b>           | <b>199,400</b>          | <b>406,811.9</b>   | <b>1,382.0</b>  | <b>405,429.9</b>   | <b>17,655.7</b>            | <b>0.0</b>      | <b>0.0</b>      |
| Laguna Gas 4 EEGSA       | 1                  | 33,000                  | 90,314.0           | 1,047.8         | 89,266.2           |                            |                 | 0.0             |
| Escuintla Gas V          | 1                  | 32,000                  | 54,404.0           |                 | 54,404.0           | 5,791.0                    |                 | 0.0             |
| Escuintla Gas III        | 1                  | 25,000                  | 89,774.2           | 239.9           | 89,534.3           | 9,489.7                    |                 | 0.0             |
| Escuintla Gas IV         | 1                  | 25,000                  | 23,742.7           | 81.1            | 23,661.6           | 2,375.0                    |                 | 0.0             |
| Laguna Gas 2 EEGSA       | 1                  | 23,450                  | 89,352.0           | 8.7             | 89,343.3           |                            |                 | 0.0             |
| Laguna Gas 3 EEGSA       | 1                  | 23,450                  | 59,225.0           | 4.5             | 59,220.5           |                            |                 | 0.0             |
| Escuintla Gas II         | 1                  | 12,500                  |                    |                 |                    |                            |                 | 0.0             |
| Laguna Gas 1 EEGSA       | 1                  | 12,500                  |                    |                 |                    |                            |                 | 0.0             |
| Escuintla Gas I          | 1                  | 12,500                  |                    |                 |                    |                            |                 | 0.0             |
| <b>Sistema Privado</b>   | <b>35</b>          | <b>217,500</b>          | <b>925,061.9</b>   | <b>631.8</b>    | <b>924,430.1</b>   | <b>7,521.0</b>             | <b>55,318.0</b> | <b>0.0</b>      |
| Cogeneración Hidro       | 2                  | 4,000                   | 11,432.4           |                 | 11,432.4           |                            |                 | 0.0             |
| Cogeneración Térmica     | 11                 | 41,500                  | 41,552.2           |                 | 41,552.2           |                            | 2,078.0         | 0.0             |
| Barcaza ENRON            | 20                 | 110,000                 | 773,281.3          |                 | 773,281.3          |                            | 53,240.0        | 0.0             |
| Cementos Progreso        | 1                  | 12,000                  | 72,000.0           |                 | 72,000.0           | 5,460.0                    |                 | 0.0             |
| Stewart & Stevenson      | 1                  | 50,000                  | 26,796.0           | 631.8           | 26,164.2           | 2,061.0                    |                 | 0.0             |

Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares.

Consumo de combustible estimado para las centrales privadas.

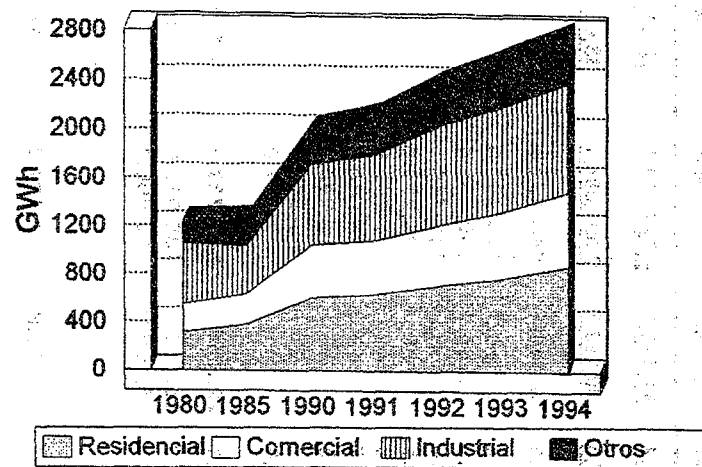


## GUATEMALA: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

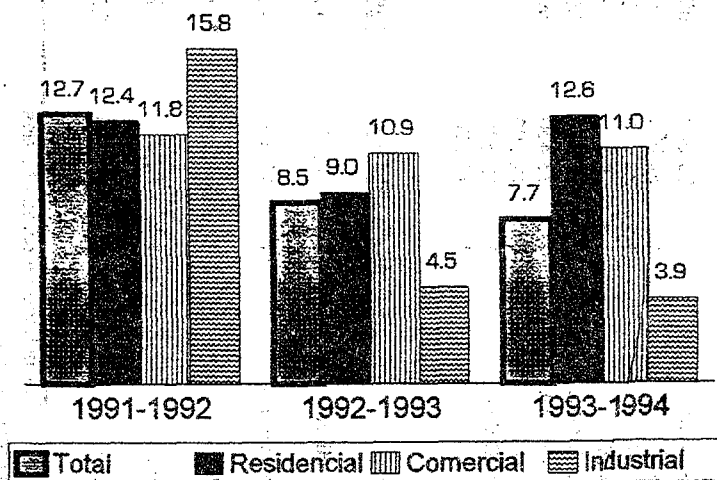
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | Comercial | Industrial | Otros |
|------|--------|-------------|-----------|------------|-------|
| 1980 | 1235.7 | 310.1       | 232.6     | 515.0      | 178.0 |
| 1985 | 1245.0 | 377.1       | 260.8     | 401.3      | 205.8 |
| 1990 | 1989.4 | 604.5       | 444.9     | 666.1      | 273.8 |
| 1991 | 2102.4 | 638.0       | 448.0     | 712.8      | 303.6 |
| 1992 | 2370.0 | 717.3       | 500.7     | 825.5      | 326.4 |
| 1993 | 2571.3 | 781.8       | 555.1     | 863.0      | 371.4 |
| 1994 | 2769.8 | 880.4       | 616.4     | 897.1      | 375.9 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 25.1        | 18.8      | 41.7       | 14.4  |
| 1985 | 100.0 | 30.3        | 20.9      | 32.2       | 16.5  |
| 1990 | 100.0 | 30.4        | 22.4      | 33.5       | 13.8  |
| 1991 | 100.0 | 30.3        | 21.3      | 33.9       | 14.4  |
| 1992 | 100.0 | 30.3        | 21.1      | 34.8       | 13.8  |
| 1993 | 100.0 | 30.4        | 21.6      | 33.6       | 14.4  |
| 1994 | 100.0 | 31.8        | 22.3      | 32.4       | 13.6  |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

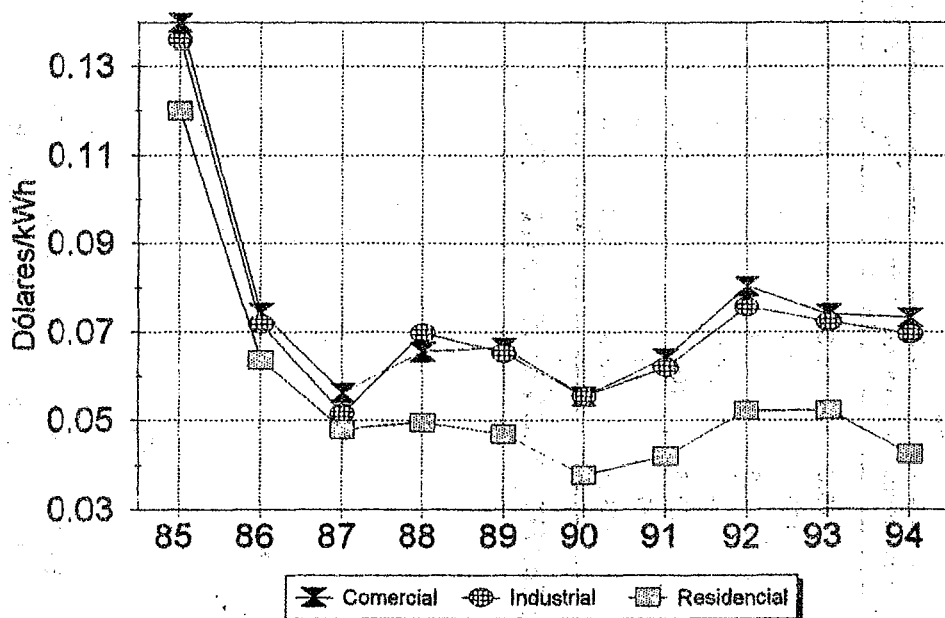
## GUATEMALA: PRECIOS PROMEDIO

### EVOLUCION RECIENTE

Dólares/kWh

| AÑO  | RESIDENCIAL | COMERCIAL | INDUSTRIAL | QUETZALES<br>POR DOLAR |
|------|-------------|-----------|------------|------------------------|
| 1985 | 0.120       | 0.140     | 0.136      | 1.00                   |
| 1986 | 0.064       | 0.074     | 0.072      | 1.88                   |
| 1987 | 0.048       | 0.056     | 0.052      | 2.50                   |
| 1988 | 0.050       | 0.066     | 0.070      | 2.62                   |
| 1989 | 0.047       | 0.066     | 0.065      | 2.83                   |
| 1990 | 0.038       | 0.056     | 0.056      | 4.50                   |
| 1991 | 0.042       | 0.064     | 0.062      | 4.99                   |
| 1992 | 0.052       | 0.080     | 0.076      | 5.15                   |
| 1993 | 0.052       | 0.074     | 0.072      | 5.60                   |
| 1994 | 0.042       | 0.073     | 0.070      | 5.75                   |

### EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

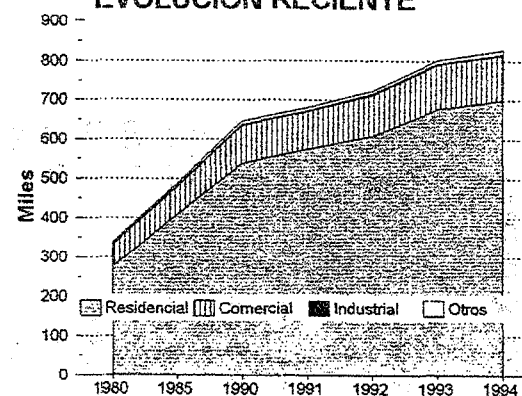
Precios corrientes.

# GUATEMALA: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

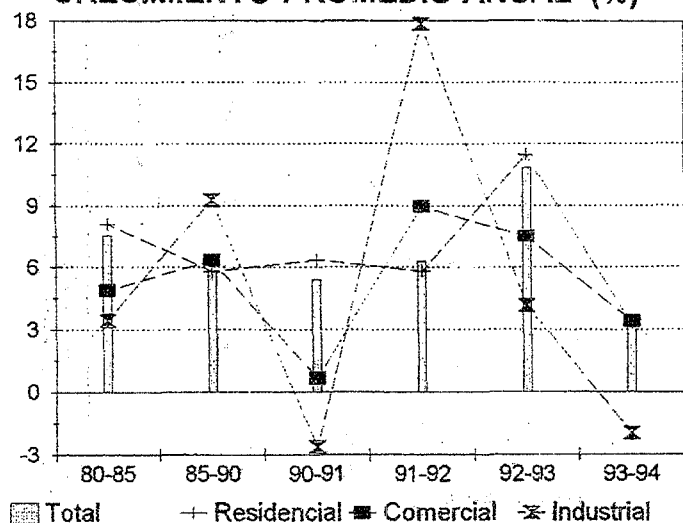
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |           |            |       | %           |           |            |       |
|------|-------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 338.2 | 276.0       | 55.3      | 1.6        | 5.3   | 81.6        | 16.4      | 0.5        | 1.6   |
| 1985 | 486.5 | 407.7       | 70.1      | 1.8        | 6.8   | 83.8        | 14.4      | 0.4        | 1.4   |
| 1990 | 646.2 | 539.9       | 95.4      | 2.9        | 8.0   | 83.6        | 14.8      | 0.4        | 1.2   |
| 1991 | 681.2 | 574.3       | 96.0      | 2.8        | 8.1   | 84.3        | 14.1      | 0.4        | 1.2   |
| 1992 | 724.0 | 607.6       | 104.6     | 3.3        | 8.5   | 83.9        | 14.5      | 0.5        | 1.2   |
| 1993 | 802.6 | 677.4       | 112.5     | 3.4        | 9.3   | 84.4        | 14.0      | 0.4        | 1.2   |
| 1994 | 827.7 | 699.5       | 116.3     | 3.4        | 8.6   | 84.5        | 14.1      | 0.4        | 1.0   |

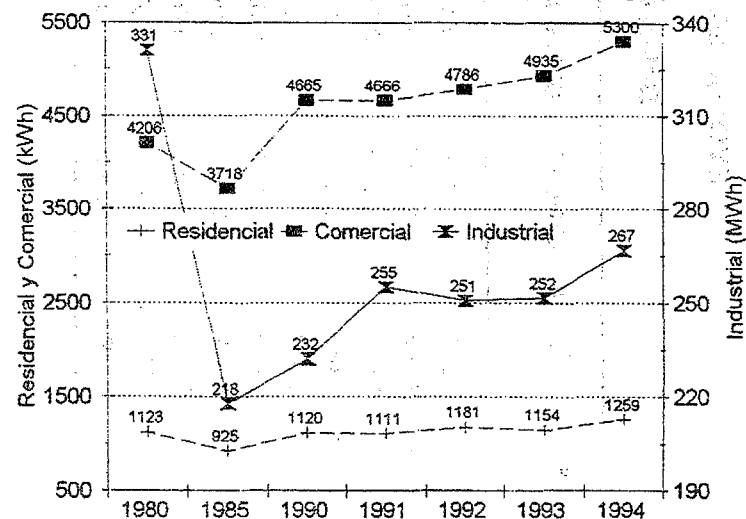
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

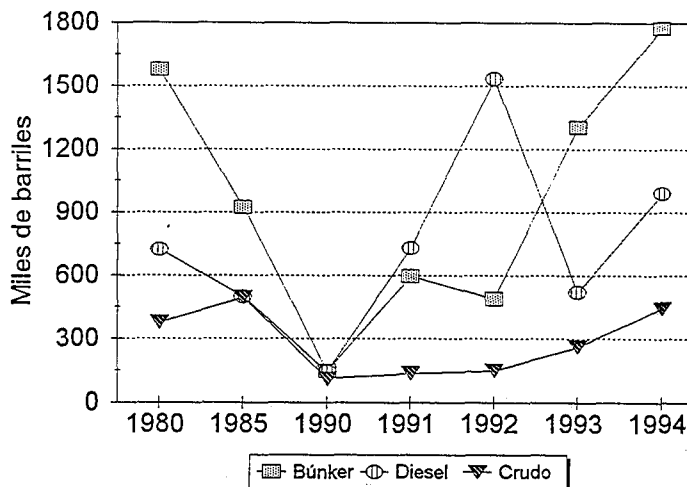
Las cifras corresponden a las ventas totales.

# GUATEMALA: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

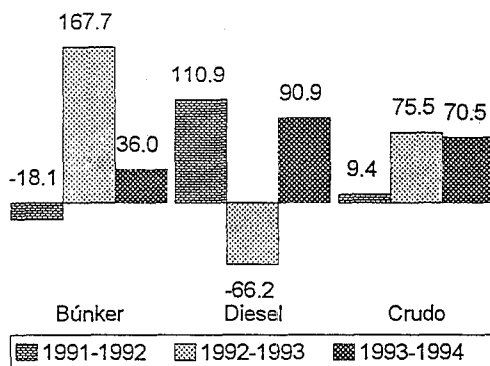
**EVOLUCION RECIENTE**  
(Miles de barriles)

| Año  | Total  | Búnker | Diesel | Crudo |
|------|--------|--------|--------|-------|
| 1980 | 2671.9 | 1574.9 | 722.3  | 374.7 |
| 1985 | 1914.0 | 921.6  | 497.9  | 494.4 |
| 1990 | 398.4  | 145.2  | 142.9  | 110.3 |
| 1991 | 1456.4 | 594.2  | 726.5  | 135.7 |
| 1992 | 2167.0 | 486.8  | 1531.7 | 148.5 |
| 1993 | 2081.5 | 1303.3 | 517.6  | 260.6 |
| 1994 | 3204.5 | 1772.1 | 988.0  | 444.4 |

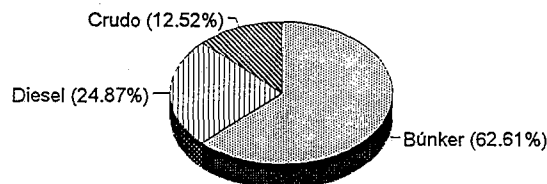
**EVOLUCION RECIENTE**



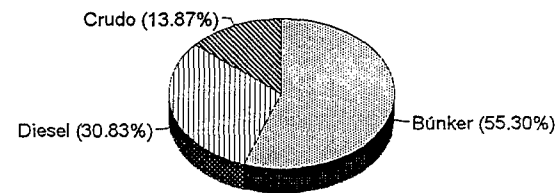
**TASAS DE CRECIMIENTO (%)**



**COMBUSTIBLE UTILIZADO, 1993**



**COMBUSTIBLE UTILIZADO, 1994**



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

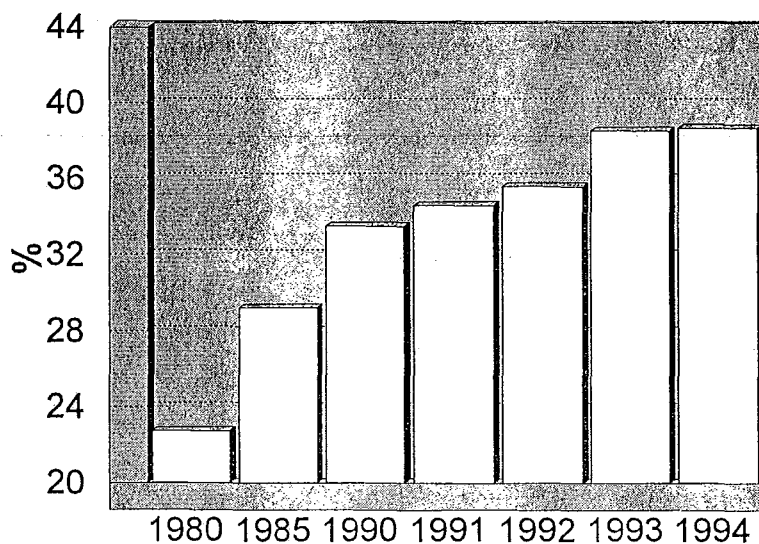
Se incorpora el consumo de combustibles estimado para las centrales privadas en 1993 y 1994.

## GUATEMALA: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Total de<br>viviendas<br>Miles | Cientes<br>residenciales<br>Miles | Indice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|-----------------------------------|-----------------------------------|
| 1980 | 6,917              | 5.7                        | 1213.5                         | 276.0                             | 22.7                              |
| 1985 | 7,963              | 5.7                        | 1397.0                         | 407.7                             | 29.2                              |
| 1990 | 9,197              | 5.7                        | 1613.5                         | 539.9                             | 33.5                              |
| 1991 | 9,467              | 5.7                        | 1660.9                         | 574.3                             | 34.6                              |
| 1992 | 9,744              | 5.7                        | 1709.5                         | 607.6                             | 35.5                              |
| 1993 | 10,030             | 5.7                        | 1759.6                         | 677.4                             | 38.5                              |
| 1994 | 10,324             | 5.7                        | 1811.2                         | 699.5                             | 38.6                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

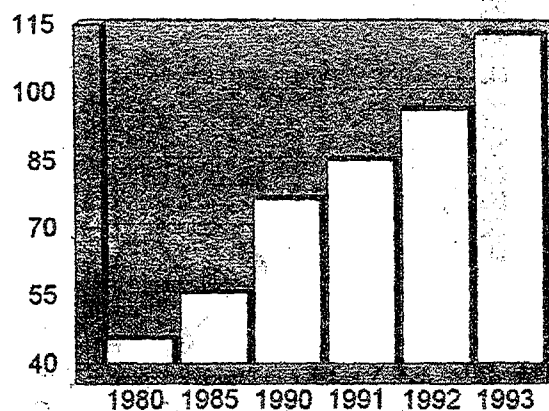
Nota: Cifras preliminares para 1994. Las estadísticas oficiales del INDE no presentan el desglose de los usuarios servidos por las empresas eléctricas municipales. Se estima que a 1994 dichas empresas tienen alrededor de 80,000 usuarios residenciales, con lo cual el índice de electrificación se incrementaría a 44%.

## GUATEMALA: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

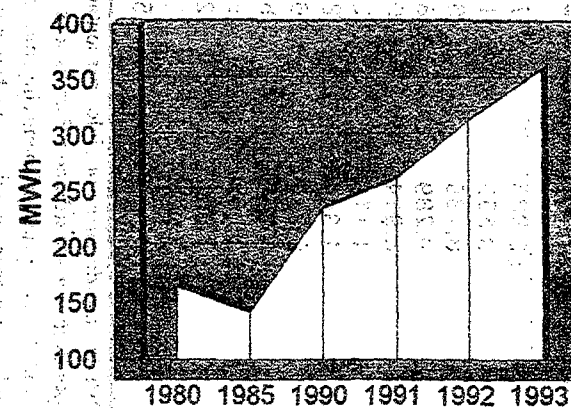
### EVOLUCION RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | 7,472     |                                    | 338.2                               | 45.3                            | 1235.7              | 165.4                                     |
| 1985 | 8,772     | 3.26                               | 486.5                               | 55.5                            | 1245.0              | 141.9                                     |
| 1990 | 8,461     | -0.72                              | 646.2                               | 76.4                            | 1989.4              | 235.1                                     |
| 1991 | 8,008     | -5.35                              | 681.2                               | 85.1                            | 2102.4              | 262.5                                     |
| 1992 | 7,527     | -6.01                              | 724.0                               | 96.2                            | 2370.0              | 314.9                                     |
| 1993 | 7,115     | -5.47                              | 802.6                               | 112.8                           | 2571.3              | 361.4                                     |
| 1994 | n.d.      |                                    | 827.7                               |                                 | 2769.8              |   |

**USUARIOS POR EMPLEADO  
EVOLUCION RECIENTE**



**ENERGIA VENDIDA POR EMPLEADO  
EVOLUCION RECIENTE**



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

La fuente de información para el número de empleados en 1980 y 1985 es el Banco Mundial.

**GUATEMALA: VARIACION DEL PRECIO PROMEDIO DE LA ENERGIA  
COMPRADA A COGENERADORES Y AUTOPRODUCTORES DURANTE 1994**

|                  | Energía comprada<br>(GWh) |                | Precio<br>dólares/kWh |                | Tasa de<br>cambio<br>Q/\$ |
|------------------|---------------------------|----------------|-----------------------|----------------|---------------------------|
|                  | Cogeneradores             | Autoprodutores | Cogeneradores         | Autoprodutores |                           |
| Total o Promedio | 52.985                    | 797.908        | 0.0554                | 0.0630         | 5.7450                    |
| Enero            | 8.553                     | 61.768         | 0.0553                | 0.0614         | 5.8339                    |
| Febrero          | 8.485                     | 66.959         | 0.0549                | 0.0673         | 5.8282                    |
| Marzo            | 9.289                     | 58.920         | 0.0551                | 0.0635         | 5.8092                    |
| Abril            | 8.914                     | 60.556         | 0.0552                | 0.0592         | 5.7825                    |
| Mayo             | 1.113                     | 62.788         | 0.0551                | 0.0608         | 5.7370                    |
| Junio            | 1.344                     | 68.870         | 0.0552                | 0.0608         | 5.7256                    |
| Julio            | 0.913                     | 66.453         | 0.0537                | 0.0646         | 5.6471                    |
| Agosto           | 1.355                     | 65.202         | 0.0563                | 0.0646         | 5.6612                    |
| Septiembre       | 1.364                     | 65.087         | 0.0553                | 0.0579         | 5.7878                    |
| Octubre          | 1.509                     | 72.473         | 0.0550                | 0.0621         | 5.7655                    |
| Noviembre        | 3.021                     | 73.016         | 0.0546                | 0.0639         | 5.7343                    |
| Diciembre        | 7.125                     | 75.816         | 0.0551                | 0.0688         | 5.6281                    |

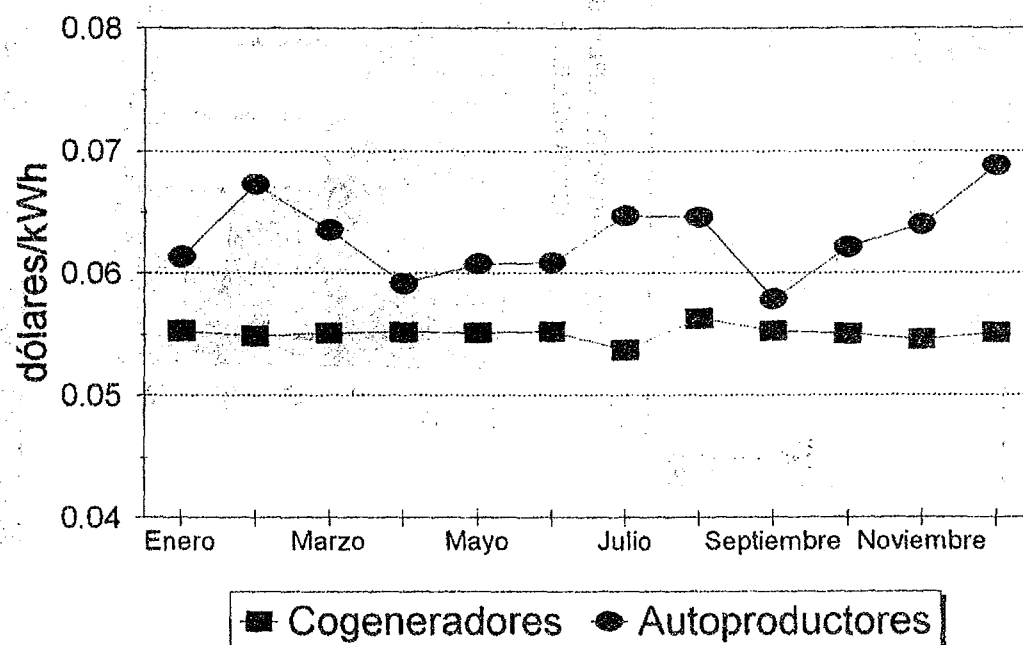
Fuente: CEPAL, sobre la base de cifras oficiales presentadas por la EEGSA.

Notas: Quetzales por dólar de acuerdo con Estadísticas Financieras Internacionales, del FMI.

Los cogeneradores son principalmente ingenios azucareros.

Los autoprodutores corresponden a contratos de la empresa ENRON. Hasta septiembre es el precio del contrato BOO. A partir de octubre en los contratos (BOO,ROM) los precios fueron: (.0609,.0716),(.0616,.0874) y (.0676,.0753) dólares/kWh.

**PRECIOS PROMEDIO EN 1994**



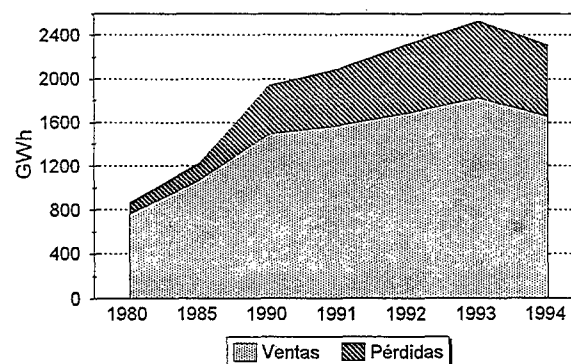
Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares.

## HONDURAS: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             |               |        | %        |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 207.8               | 156            | 854.2                   | 9.0         | 18.3        | 0.6     | 864.1       | n.d.          | 759.5  | 12.1     | 63.2            |
| 1985 | 552.3               | 220            | 1346.2                  | 134.2       | 6.3         | 5.7     | 1224.0      | n.d.          | 1064.8 | 13.0     | 63.5            |
| 1990 | 524.6               | 351            | 2273.6                  | 337.4       | 3.2         | 0.0     | 1939.4      | n.d.          | 1489.5 | 23.2     | 63.1            |
| 1991 | 524.6               | 377            | 2305.9                  | 217.9       | 3.7         | 0.2     | 2091.8      | -             | 1568.5 | 25.0     | 63.3            |
| 1992 | 524.6               | 433            | 2314.7                  | 8.0         | 12.3        | 0.7     | 2319.7      | -             | 1684.5 | 27.4     | 61.2            |
| 1993 | 524.6               | 447            | 2478.9                  | 13.3        | 64.4        | 3.0     | 2533.0      | 3.6           | 1820.2 | 28.1     | 64.7            |
| 1994 | 590.2               | 453            | 2133.0                  | 6.2         | 61.9        | 118.0   | 2306.7      | 424.4         | 1652.0 | 28.4     | 58.1            |

DISTRIBUCION DE LA ENERGIA DISPONIBLE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con otros países.

Las compras corresponden a transacciones internas en el país con otras empresas.

Las pérdidas corresponden a transmisión y distribución.

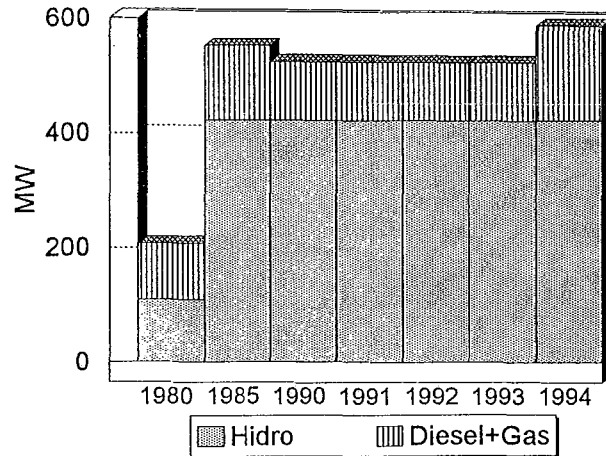


## HONDURAS: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

### EVOLUCION RECIENTE (MW)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 207.8 | 108.5 | 0.0   | 99.3       |
| 1985 | 552.3 | 423.0 | 0.0   | 129.3      |
| 1990 | 524.6 | 423.0 | 0.0   | 101.6      |
| 1991 | 524.6 | 423.0 | 0.0   | 101.6      |
| 1992 | 524.6 | 423.0 | 0.0   | 101.6      |
| 1993 | 524.6 | 423.0 | 0.0   | 101.6      |
| 1994 | 590.2 | 424.2 | 0.0   | 166.0      |

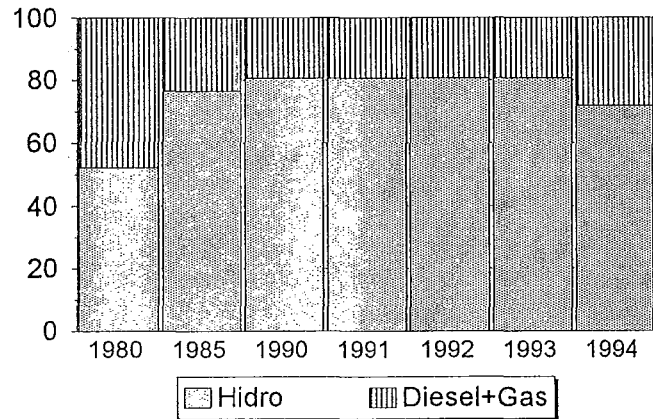
### EVOLUCION RECIENTE



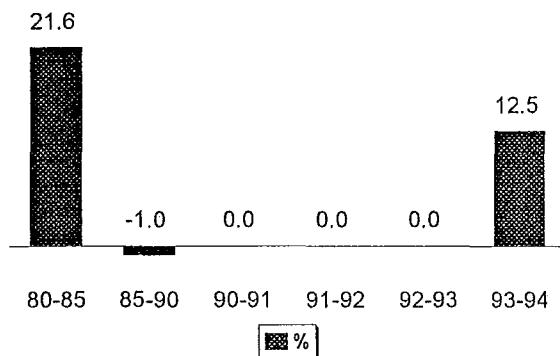
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 100.0 | 52.2  | 0.0   | 47.8       |
| 1985 | 100.0 | 76.6  | 0.0   | 23.4       |
| 1990 | 100.0 | 80.6  | 0.0   | 19.4       |
| 1991 | 100.0 | 80.6  | 0.0   | 19.4       |
| 1992 | 100.0 | 80.6  | 0.0   | 19.4       |
| 1993 | 100.0 | 80.6  | 0.0   | 19.4       |
| 1994 | 100.0 | 71.9  | 0.0   | 28.1       |

### ESTRUCTURA (%)



### TASAS DE CRECIMIENTO ANUALES



Fuente: CEPAL, sobre la base de cifras oficiales.  
Nota: Cifras preliminares para 1994.

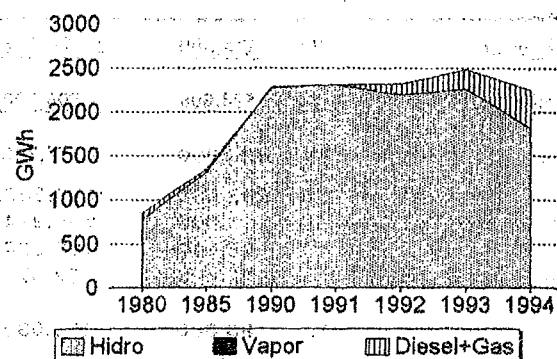
## HONDURAS: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro  | Vapor | Diesel+Gas |
|------|--------|--------|-------|------------|
| 1980 | 854.1  | 782.1  | 0.0   | 72.0       |
| 1985 | 1346.2 | 1306.7 | 0.0   | 39.6       |
| 1990 | 2273.6 | 2278.6 | 0.0   | -5.0 a/    |
| 1991 | 2305.9 | 2309.8 | 0.0   | -3.9 a/    |
| 1992 | 2314.7 | 2197.5 | 0.0   | 117.2      |
| 1993 | 2481.9 | 2259.3 | 0.0   | 222.5      |
| 1994 | 2251.0 | 1817.3 | 0.0   | 433.8      |

a/ Para las plantas de diesel y gas, el consumo propio fue mayor que la generación en 1990 y 1991.

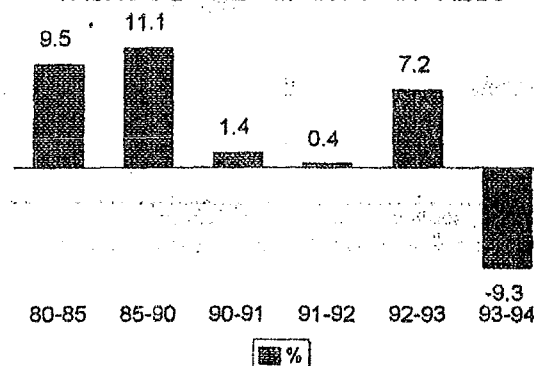
### EVOLUCION RECIENTE



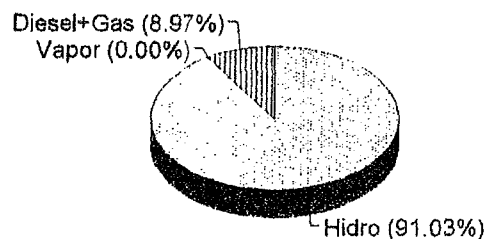
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 100.0 | 91.6  | 0.0   | 8.4        |
| 1985 | 100.0 | 97.1  | 0.0   | 2.9        |
| 1990 | 100.0 | 100.2 | 0.0   | -0.2       |
| 1991 | 100.0 | 100.2 | 0.0   | -0.2       |
| 1992 | 100.0 | 94.9  | 0.0   | 5.1        |
| 1993 | 100.0 | 91.0  | 0.0   | 9.0        |
| 1994 | 100.0 | 80.7  | 0.0   | 19.3       |

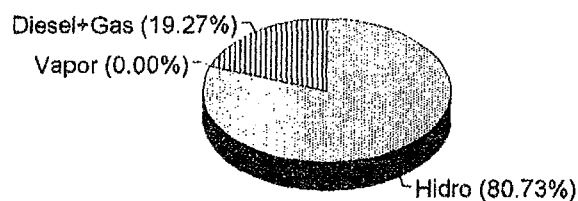
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## HONDURAS: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |             |                |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-------------|----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil    | Diesel marino  |
| <b>Sistema Integrado</b> | <b>24</b>          | <b>524,600</b>          | <b>2,511,782.2</b> | <b>29,918.5</b> | <b>2,481,863.7</b> | <b>13,178.2</b>            | <b>61.4</b> | <b>2,662.1</b> |
| <b>Sistema Público</b>   | <b>24</b>          | <b>524,600</b>          | <b>2,508,808.7</b> | <b>29,918.5</b> | <b>2,478,890.2</b> | <b>13,178.2</b>            | <b>61.4</b> | <b>2,662.1</b> |
| <b>Hidráulica</b>        | <b>11</b>          | <b>423,000</b>          | <b>2,277,716.2</b> | <b>18,397.9</b> | <b>2,259,318.3</b> |                            |             |                |
| El Cajón                 | 4                  | 292,000                 | 1,494,250.8        | 16,499.2        | 1,477,751.6        |                            |             |                |
| Río Lindo                | 4                  | 80,000                  | 534,974.4          | 1,195.1         | 533,779.3          |                            |             |                |
| Cafiaveral               | 2                  | 28,500                  | 185,520.0          | 455.2           | 185,064.8          |                            |             |                |
| El Nispero               | 1                  | 22,500                  | 62,971.0           | 248.4           | 62,722.6           |                            |             |                |
| <b>Diesel</b>            | <b>12</b>          | <b>86,600</b>           | <b>231,092.5</b>   | <b>11,520.6</b> | <b>219,571.9</b>   | <b>13,178.2</b>            | <b>61.4</b> | <b>2,662.1</b> |
| Sulzer                   | 4                  | 30,000                  | 100,279.3          | 5,633.1         | 94,646.2           | 4,691.6                    | 14.3        | 1,525.0        |
| Alsthom                  | 4                  | 30,000                  | 95,926.5           | 4,112.3         | 91,814.2           | 6,434.1                    |             | 641.6          |
| La Ceiba                 | 4                  | 26,600                  | 34,886.7           | 1,775.2         | 33,111.5           | 2,052.5                    | 47.1        | 495.6          |
| <b>Turbogas</b>          | <b>1</b>           | <b>15,000</b>           | <b>0.0</b>         | <b>0.0</b>      | <b>0.0</b>         | <b>0.0</b>                 | <b>0.0</b>  | <b>0.0</b>     |
| La Puerta                | 1                  | 15,000                  |                    |                 |                    |                            |             |                |
| <b>Sistema Privado</b>   | <b>0</b>           | <b>0</b>                | <b>2,973.5</b>     | <b>0.0</b>      | <b>2,973.5</b>     | <b>0.0</b>                 | <b>0.0</b>  | <b>0.0</b>     |
| Rosario                  | 0                  |                         | 2,037.0            |                 | 2,037.0            |                            |             |                |
| Zacapa                   |                    |                         | 936.5              |                 | 936.5              |                            |             |                |

Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: No se dispone de otros datos para Rosario y Zacapa.

## HONDURAS: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                |               |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|----------------|---------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil       | Diesel marino |
| <b>Sistema Integrado</b> | <b>34</b>          | <b>590,200</b>          | <b>2,281,514.5</b> | <b>30,479.6</b> | <b>2,251,034.9</b> | <b>22,670.2</b>            | <b>7,603.4</b> | <b>368.9</b>  |
| <b>Sistema Público</b>   | <b>24</b>          | <b>530,200</b>          | <b>2,163,525.9</b> | <b>30,477.9</b> | <b>2,133,048.0</b> | <b>22,670.2</b>            | <b>22.2</b>    | <b>368.9</b>  |
| <b>Hidráulica</b>        | <b>11</b>          | <b>424,200</b>          | <b>1,834,131.0</b> | <b>16,847.9</b> | <b>1,817,283.1</b> |                            |                |               |
| El Cajón                 | 4                  | 292,000                 | 950,882.6          | 14,872.4        | 936,210.2          |                            |                |               |
| Río Lindo                | 4                  | 80,000                  | 616,360.3          | 1,372.0         | 614,988.3          |                            |                |               |
| Cañaveral                | 2                  | 28,500                  | 219,250.0          | 571.6           | 218,678.4          |                            |                |               |
| El Nispero               | 1                  | 22,500                  | 46,197.0           | 231.7           | 45,955.3           |                            |                |               |
| Santa María              |                    | 1,200                   | 1,451.1            | 0.2             | 1,450.9            |                            |                |               |
| <b>Diesel</b>            | <b>12</b>          | <b>91,000</b>           | <b>322,536.3</b>   | <b>13,630.0</b> | <b>308,906.3</b>   | <b>21,933.7</b>            | <b>22.2</b>    | <b>368.9</b>  |
| Sulzer                   | 4                  | 30,000                  | 132,531.5          | 6,233.5         | 126,298.0          | 8,090.2                    | 22.2           | 317.8         |
| Alsthom                  | 4                  | 30,000                  | 123,231.7          | 5,256.4         | 117,975.3          | 8,830.5                    |                | 0.0           |
| La Ceiba                 | 4                  | 26,600                  | 55,457.2           | 2,140.1         | 53,317.1           | 4,120.8                    |                | 51.1          |
| Santa Fé                 |                    | 4,400                   | 11,315.9           |                 | 11,315.9           | 892.2                      |                | 0.0           |
| <b>Turbogas</b>          | <b>1</b>           | <b>15,000</b>           | <b>6,858.6</b>     | <b>0.0</b>      | <b>6,858.6</b>     | <b>736.5</b>               | <b>0.0</b>     | <b>0.0</b>    |
| La Puerta                | 1                  | 15,000                  | 6,858.6            |                 | 6,858.6            | 736.5                      |                | 0             |
| <b>Sistema Privado</b>   | <b>10</b>          | <b>60,000</b>           | <b>117,988.6</b>   | <b>1.7</b>      | <b>117,986.9</b>   | <b>0.0</b>                 | <b>7,581.2</b> | <b>0.0</b>    |
| ELCOSA                   | 10                 | 60,000                  | 109,927.9          | 1.7             | 109,926.2          |                            | 7,581.2        |               |
| Zacapa y Ampac           |                    |                         | 8,060.7            |                 | 8,060.7            |                            |                |               |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares.

Consumo de combustible estimado para la central privada.

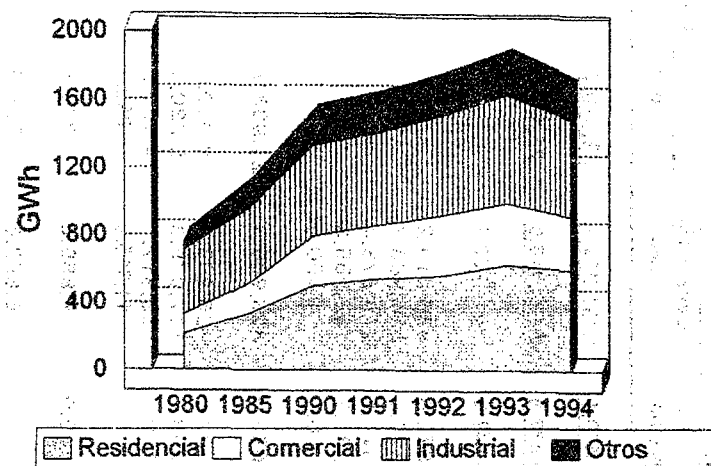
No se dispone de otros datos para Zacapa y Ampac.

## HONDURAS: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

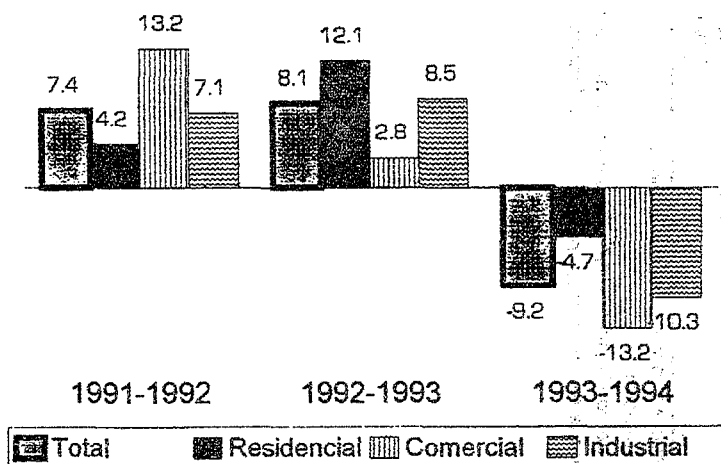
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | Comercial | Industrial | Otros |
|------|--------|-------------|-----------|------------|-------|
| 1980 | 759.3  | 211.4       | 117.1     | 378.9      | 52.0  |
| 1985 | 1064.8 | 330.2       | 177.1     | 450.2      | 107.3 |
| 1990 | 1489.5 | 502.0       | 291.2     | 537.6      | 158.7 |
| 1991 | 1568.5 | 539.4       | 315.9     | 549.6      | 163.6 |
| 1992 | 1684.5 | 562.0       | 357.5     | 588.8      | 176.2 |
| 1993 | 1820.2 | 629.8       | 367.6     | 638.6      | 184.3 |
| 1994 | 1652.0 | 600.3       | 319.1     | 572.7      | 159.9 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 27.8        | 15.4      | 49.9       | 6.8   |
| 1985 | 100.0 | 31.0        | 16.6      | 42.3       | 10.1  |
| 1990 | 100.0 | 33.7        | 19.5      | 36.1       | 10.7  |
| 1991 | 100.0 | 34.4        | 20.1      | 35.0       | 10.4  |
| 1992 | 100.0 | 33.4        | 21.2      | 35.0       | 10.5  |
| 1993 | 100.0 | 34.6        | 20.2      | 35.1       | 10.1  |
| 1994 | 100.0 | 36.3        | 19.3      | 34.7       | 9.7   |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

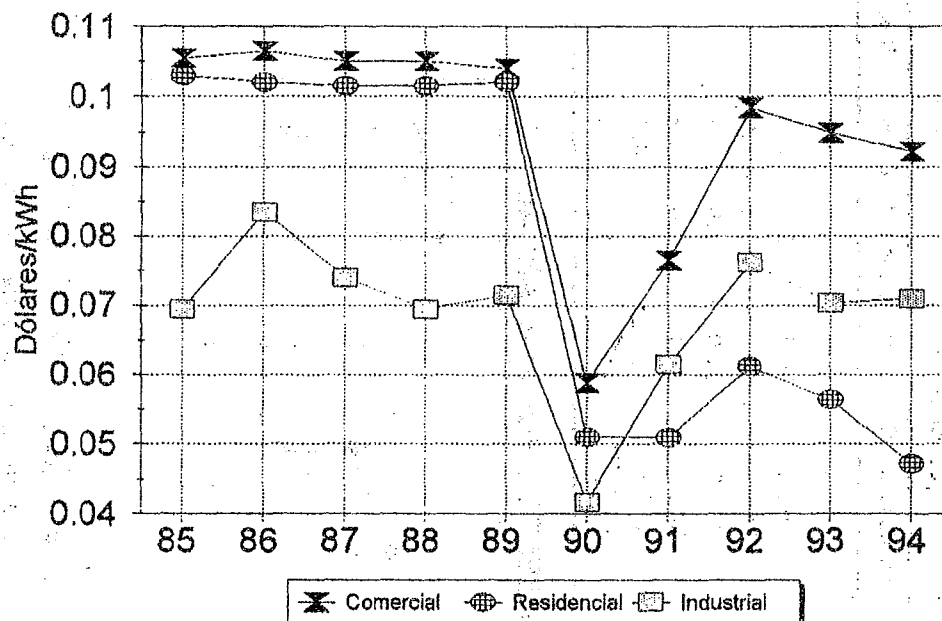
## HONDURAS: PRECIOS PROMEDIO

### EVOLUCION RECIENTE

Dólares/kWh

| AÑO  | RESIDENCIAL | COMERCIAL | INDUSTRIAL | LEMPIRAS<br>POR DOLAR |
|------|-------------|-----------|------------|-----------------------|
| 1985 | 0.103       | 0.106     | 0.070      | 2.00                  |
| 1986 | 0.102       | 0.107     | 0.084      | 2.00                  |
| 1987 | 0.102       | 0.105     | 0.074      | 2.00                  |
| 1988 | 0.102       | 0.105     | 0.070      | 2.00                  |
| 1989 | 0.102       | 0.104     | 0.072      | 2.00                  |
| 1990 | 0.051       | 0.059     | 0.042      | 4.10                  |
| 1991 | 0.051       | 0.077     | 0.061      | 5.32                  |
| 1992 | 0.061       | 0.098     | 0.076      | 5.54                  |
| 1993 | 0.056       | 0.095     | 0.070      | 6.57                  |
| 1994 | 0.047       | 0.092     | 0.071      | 8.50                  |

### EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

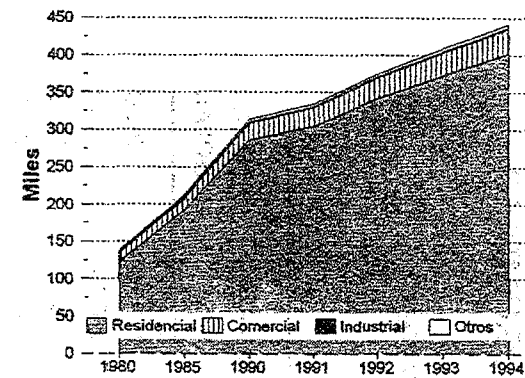
Precios corrientes.

# HONDURAS: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

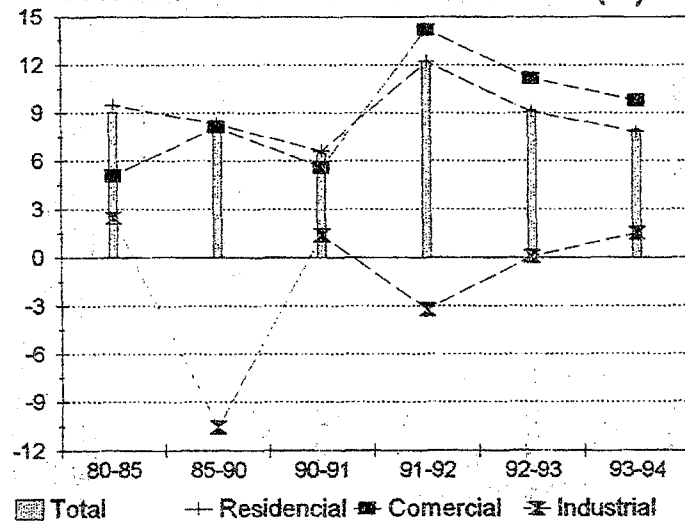
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |           |            |       | %           |           |            |       |
|------|-------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 137.9 | 122.0       | 12.0      | 2.2        | 1.6   | 88.5        | 8.7       | 1.6        | 1.2   |
| 1985 | 212.5 | 192.0       | 15.4      | 2.5        | 2.6   | 90.4        | 7.2       | 1.2        | 1.2   |
| 1990 | 313.7 | 286.1       | 22.7      | 1.5        | 3.5   | 91.2        | 7.2       | 0.5        | 1.1   |
| 1991 | 334.0 | 305.0       | 24.0      | 1.5        | 3.6   | 91.3        | 7.2       | 0.4        | 1.1   |
| 1992 | 374.8 | 342.1       | 27.4      | 1.4        | 3.9   | 91.3        | 7.3       | 0.4        | 1.0   |
| 1993 | 409.3 | 373.1       | 30.4      | 1.4        | 4.3   | 91.2        | 7.4       | 0.3        | 1.0   |
| 1994 | 441.7 | 402.3       | 33.4      | 1.4        | 4.6   | 91.1        | 7.6       | 0.3        | 1.0   |

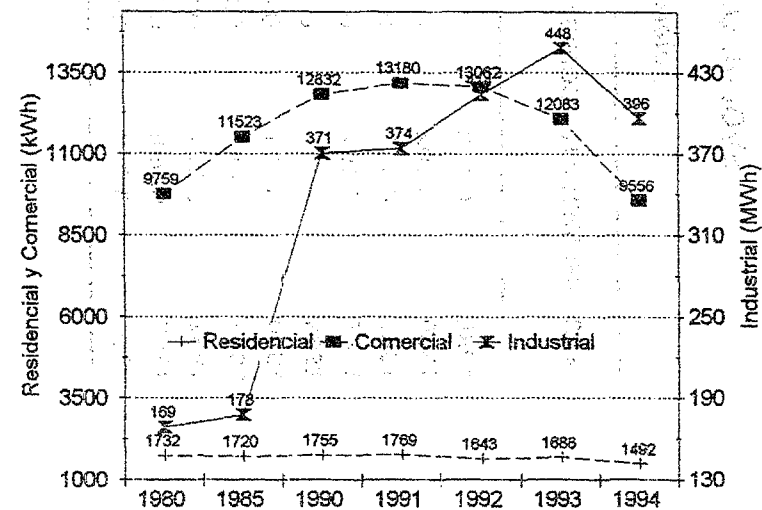
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

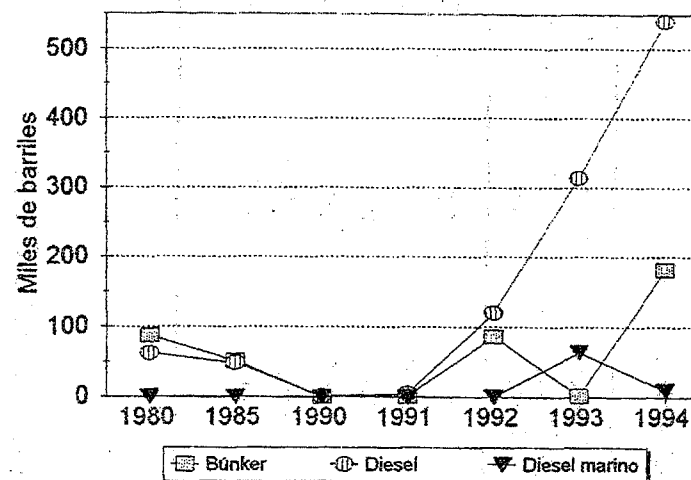
Las cifras corresponden a las ventas totales.

# HONDURAS: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

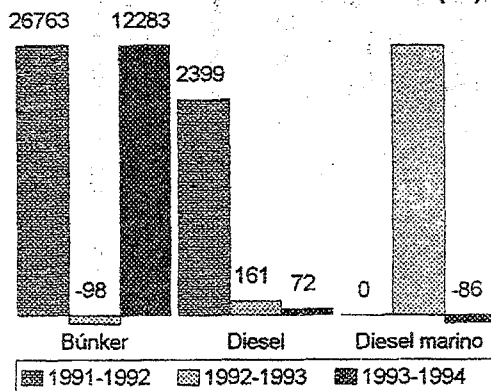
## EVOLUCION RECIENTE (Miles de barriles)

| Año  | Total | Búnker | Diesel | Diesel marino |
|------|-------|--------|--------|---------------|
| 1980 | 148.1 | 86.5   | 61.6   | 0.0           |
| 1985 | 97.9  | 50.3   | 47.6   | 0.0           |
| 1990 | 0.6   | 0.0    | 0.5    | 0.0           |
| 1991 | 5.1   | 0.3    | 4.8    | 0.0           |
| 1992 | 205.7 | 85.7   | 120.0  | 0.0           |
| 1993 | 378.6 | 1.5    | 313.8  | 63.4          |
| 1994 | 729.6 | 181.0  | 539.8  | 8.8           |

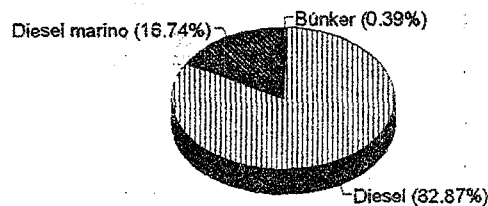
## EVOLUCION RECIENTE



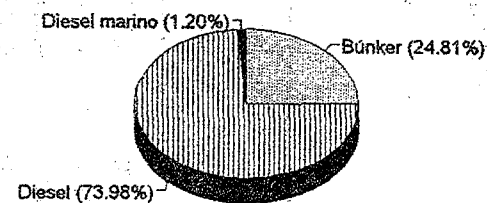
## TASAS DE CRECIMIENTO (%)



## COMBUSTIBLE UTILIZADO, 1993



## COMBUSTIBLE UTILIZADO, 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Se incorpora el consumo de combustible estimado para la central privada en 1994.

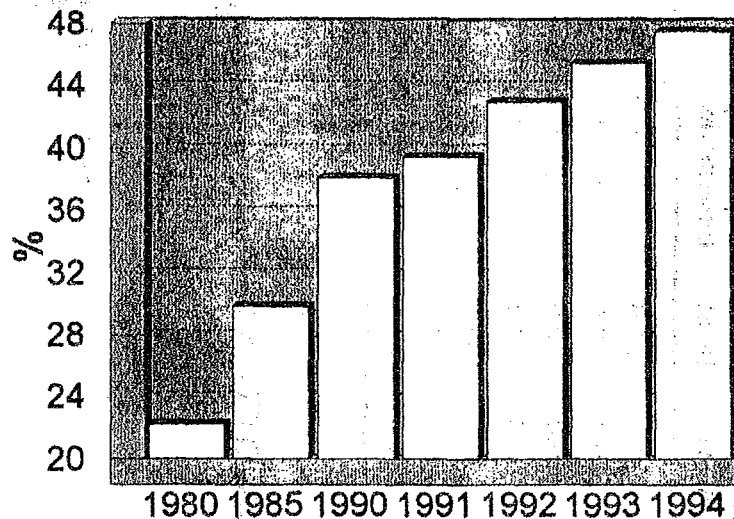


## HONDURAS: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Total de<br>viviendas<br>Miles | Clientes<br>residenciales<br>Miles | Indice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|------------------------------------|-----------------------------------|
| 1980 | 3,569              | 6.5                        | 549.1                          | 122.0                              | 22.2                              |
| 1985 | 4,186              | 6.5                        | 644.0                          | 192.0                              | 29.8                              |
| 1990 | 4,879              | 6.5                        | 750.6                          | 286.1                              | 38.1                              |
| 1991 | 5,028              | 6.5                        | 773.5                          | 305.0                              | 39.4                              |
| 1992 | 5,180              | 6.5                        | 796.9                          | 342.1                              | 42.9                              |
| 1993 | 5,341              | 6.5                        | 821.7                          | 373.1                              | 45.4                              |
| 1994 | 5,506              | 6.5                        | 847.1                          | 402.3                              | 47.5                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

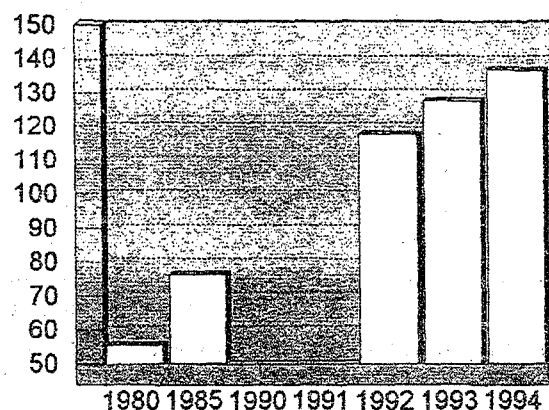
Nota: Cifras preliminares para 1994.

## HONDURAS: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

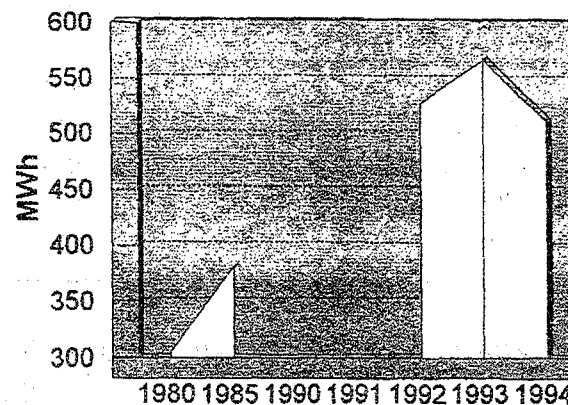
### EVOLUCION RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | 2,485     |                                    | 137.9                               | 55.5                            | 759.3               | 305.6                                     |
| 1985 | 2,789     | 2.34                               | 212.5                               | 76.2                            | 1064.8              | 381.8                                     |
| 1990 | n.d.      |                                    | 313.7                               |                                 | 1489.5              |   |
| 1991 | n.d.      |                                    | 334.0                               |                                 | 1568.5              |   |
| 1992 | 3,194     |                                    | 374.8                               | 117.4                           | 1684.5              | 527.4                                     |
| 1993 | 3,210     | 0.50                               | 409.3                               | 127.5                           | 1820.2              | 567.0                                     |
| 1994 | 3,234     | 0.75                               | 441.7                               | 136.6                           | 1652.0              | 510.8                                     |

**USUARIOS POR EMPLEADO  
EVOLUCION RECIENTE**



**ENERGIA VENDIDA POR EMPLEADO  
EVOLUCION RECIENTE**



Fuente: CEPAL, sobre la base de cifras oficiales.

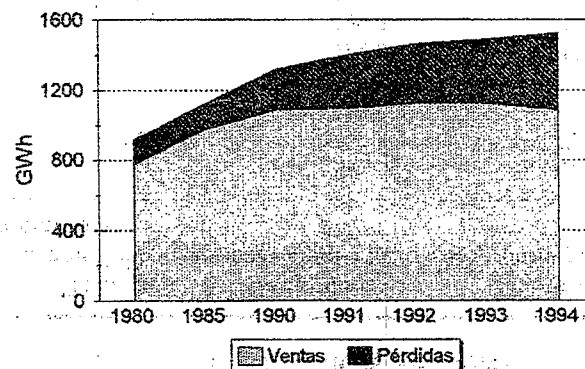
Notas: Cifras preliminares para 1994.

La fuente de información para el número de empleados en 1980 y 1985 es el Banco Mundial.

## NICARAGUA: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             |               | %      |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 292.6               | 175            | 926.8                   | 18.3        | 8.9         | 0.0     | 917.5       | n.d.          | 774.7  | 15.6     | 59.8            |
| 1985 | 326.0               | 213            | 932.3                   | 10.5        | 197.5       | 0.0     | 1119.4      | n.d.          | 973.4  | 13.0     | 60.0            |
| 1990 | 363.4               | 253            | 1251.0                  | 3.2         | 71.2        | 0.0     | 1319.0      | 11.5          | 1087.3 | 17.6     | 59.5            |
| 1991 | 363.4               | 271            | 1307.6                  | 3.7         | 95.3        | 0.0     | 1399.2      | 23.1          | 1094.6 | 21.8     | 58.9            |
| 1992 | 390.4               | 286            | 1427.0                  | 0.0         | 31.5        | 3.8     | 1462.3      | 48.4          | 1125.5 | 23.0     | 58.4            |
| 1993 | 390.4               | 296            | 1536.5                  | 60.3        | 11.9        | 3.1     | 1491.2      | 16.6          | 1124.5 | 24.6     | 57.5            |
| 1994 | 390.4               | 312            | 1540.9                  | 65.9        | 46.5        | 6.3     | 1527.8      | 115.8         | 1089.1 | 28.7     | 55.9            |

**DISTRIBUCION DE LA ENERGIA DISPONIBLE**



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con otros países.

Las compras corresponden a transacciones internas en el país con otras empresas.

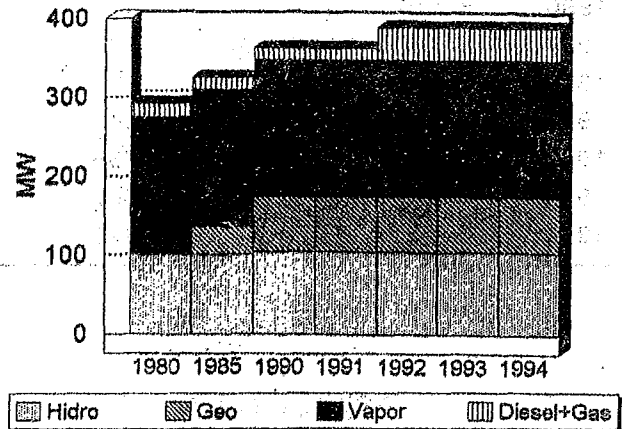
Las pérdidas corresponden a transmisión y distribución.

## NICARAGUA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

### EVOLUCION RECIENTE (MW)

| Año  | Total | Hidro | Geo  | Vapor | Diesel+Gas |
|------|-------|-------|------|-------|------------|
| 1980 | 292.6 | 100.0 | 0.0  | 175.0 | 17.6       |
| 1985 | 326.0 | 100.0 | 35.0 | 175.0 | 16.0       |
| 1990 | 363.4 | 103.4 | 70.0 | 175.0 | 15.0       |
| 1991 | 363.4 | 103.4 | 70.0 | 175.0 | 15.0       |
| 1992 | 390.4 | 103.4 | 70.0 | 175.0 | 42.0       |
| 1993 | 390.4 | 103.4 | 70.0 | 175.0 | 42.0       |
| 1994 | 390.4 | 103.4 | 70.0 | 175.0 | 42.0       |

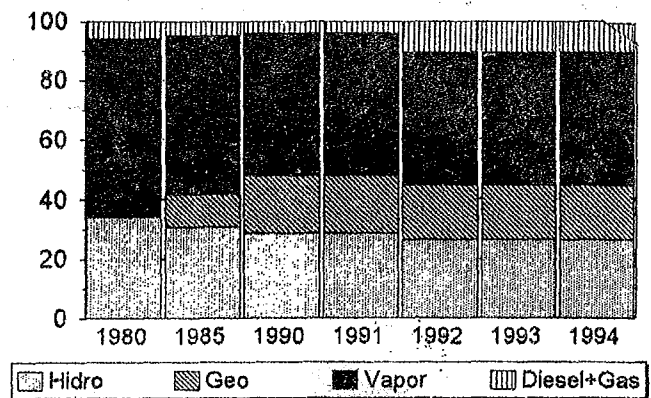
### EVOLUCION RECIENTE



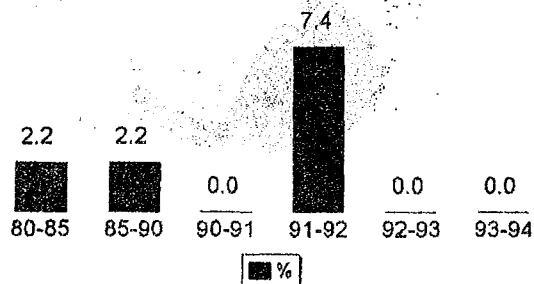
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo  | Vapor | Diesel+Gas |
|------|-------|-------|------|-------|------------|
| 1980 | 100.0 | 34.2  | 0.0  | 59.8  | 6.0        |
| 1985 | 100.0 | 30.7  | 10.7 | 53.7  | 4.9        |
| 1990 | 100.0 | 28.5  | 19.3 | 48.2  | 4.1        |
| 1991 | 100.0 | 28.5  | 19.3 | 48.2  | 4.1        |
| 1992 | 100.0 | 26.5  | 17.9 | 44.8  | 10.8       |
| 1993 | 100.0 | 26.5  | 17.9 | 44.8  | 10.8       |
| 1994 | 100.0 | 26.5  | 17.9 | 44.8  | 10.8       |

### ESTRUCTURA (%)



### TASAS DE CRECIMIENTO ANUALES



Fuente: CEPAL, sobre la base de cifras oficiales.

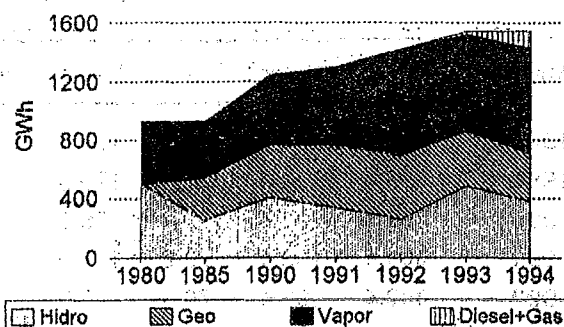
Nota: Cifras preliminares para 1994.

## NICARAGUA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro | Geo   | Vapor | Diesel+ Gas |
|------|--------|-------|-------|-------|-------------|
| 1980 | 926.8  | 497.4 | 0.0   | 425.9 | 3.5         |
| 1985 | 932.3  | 254.8 | 284.6 | 385.5 | 7.4         |
| 1990 | 1251.0 | 401.7 | 365.3 | 481.5 | 4.5         |
| 1991 | 1307.6 | 335.6 | 427.7 | 543.6 | 0.7         |
| 1992 | 1427.0 | 256.0 | 435.1 | 735.5 | 0.5         |
| 1993 | 1539.6 | 481.7 | 376.6 | 662.4 | 18.9        |
| 1994 | 1547.2 | 381.7 | 327.8 | 722.5 | 115.1       |

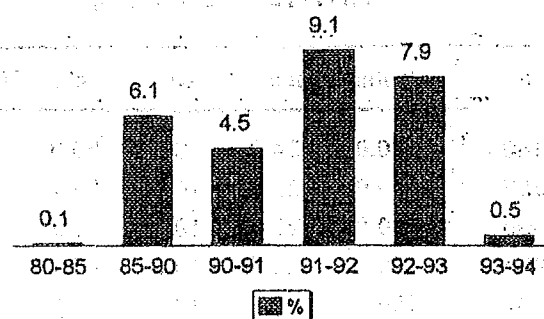
### EVOLUCION RECIENTE



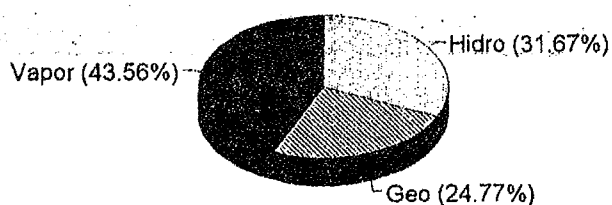
### ESTRUCTURA (%)

| Año  | Total | Hidro | Geo  | Vapor | Diesel+ Gas |
|------|-------|-------|------|-------|-------------|
| 1980 | 100.0 | 53.7  | 0.0  | 46.0  | 0.4         |
| 1985 | 100.0 | 27.3  | 30.5 | 41.3  | 0.8         |
| 1990 | 100.0 | 32.1  | 29.0 | 38.5  | 0.4         |
| 1991 | 100.0 | 25.7  | 32.7 | 41.6  | 0.1         |
| 1992 | 100.0 | 17.9  | 30.5 | 51.5  | 0.0         |
| 1993 | 100.0 | 31.3  | 24.5 | 43.0  | 1.2         |
| 1994 | 100.0 | 24.7  | 21.2 | 46.7  | 7.4         |

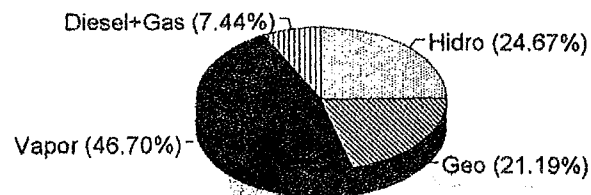
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.

## NICARAGUA: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        |
| <b>Sistema Integrado</b> | <b>15</b>          | <b>390,406</b>          | <b>1,614,962.0</b> | <b>75,359.3</b> | <b>1,539,602.7</b> | <b>1,852.7</b>             | <b>57,125.0</b> |
| <b>Sistema Público</b>   | <b>15</b>          | <b>390,406</b>          | <b>1,611,862.0</b> | <b>75,359.3</b> | <b>1,536,502.7</b> | <b>1,852.7</b>             | <b>57,125.0</b> |
| <b>Hidráulica</b>        | <b>6</b>           | <b>103,406</b>          | <b>482,957.4</b>   | <b>1,280.4</b>  | <b>481,677.0</b>   |                            |                 |
| Centroamérica            | 2                  | 50,000                  | 272,710.0          | 554.1           | 272,155.9          |                            |                 |
| Carlos Fonseca           | 2                  | 50,000                  | 203,638.3          | 638.3           | 203,000.0          |                            |                 |
| Wabule-Las Canoas        | 2                  | 3,406                   | 6,609.1            | 88.0            | 6,521.1            |                            |                 |
| <b>Geotérmica</b>        | <b>2</b>           | <b>70,000</b>           | <b>405,550.0</b>   | <b>28,929.3</b> | <b>376,620.7</b>   |                            |                 |
| Patricio Argüello        | 2                  | 70,000                  | 405,550.0          | 28,929.3        | 376,620.7          |                            |                 |
| <b>Vapor</b>             | <b>5</b>           | <b>175,000</b>          | <b>704,341.6</b>   | <b>45,029.0</b> | <b>659,312.6</b>   | <b>0.0</b>                 | <b>57,125.0</b> |
| Nicaragua                | 2                  | 100,000                 | 507,188.0          | 25,142.0        | 482,046.0          |                            | 38,479.0        |
| Managua (Vapor)          | 3                  | 75,000                  | 197,153.6          | 19,887.0        | 177,266.6          |                            | 18,646.0        |
| <b>Turbogas</b>          | <b>2</b>           | <b>42,000</b>           | <b>19,013.0</b>    | <b>120.6</b>    | <b>18,892.4</b>    | <b>1,852.7</b>             | <b>0.0</b>      |
| José D. Estrada          | 1                  | 27,000                  | 19,013             | 120.6           | 18,892.4           | 1,852.7                    |                 |
| Germán Pomáres           | 1                  | 15,000                  |                    |                 |                    |                            |                 |
| <b>Sistema Privado</b>   | <b>0</b>           | <b>0</b>                | <b>3,100.0</b>     | <b>0.0</b>      | <b>3,100.0</b>     | <b>0.0</b>                 | <b>0.0</b>      |
| <b>Timal</b>             |                    |                         | <b>3,100.0</b>     |                 | <b>3,100.0</b>     |                            |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.  
No se dispone de otros datos para Timal.

## NICARAGUA: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        |
| <b>Sistema Integrado</b> | <b>15</b>          | <b>390,406</b>          | <b>1,625,540.5</b> | <b>78,347.9</b> | <b>1,547,192.6</b> | <b>10,988.8</b>            | <b>56,674.3</b> |
| <b>Sistema Público</b>   | <b>15</b>          | <b>390,406</b>          | <b>1,619,240.5</b> | <b>78,347.9</b> | <b>1,540,892.6</b> | <b>10,988.8</b>            | <b>56,674.3</b> |
| <b>Hidráulica</b>        | <b>6</b>           | <b>103,406</b>          | <b>383,213.4</b>   | <b>1,498.5</b>  | <b>381,714.9</b>   |                            |                 |
| Centroamérica            | 2                  | 50,000                  | 225,549.1          | 572.2           | 224,976.9          |                            |                 |
| Carlos Fonseca           | 2                  | 50,000                  | 151,957.6          | 836.2           | 151,121.4          |                            |                 |
| Wabule-Las Canoas        | 2                  | 3,406                   | 5,706.7            | 90.1            | 5,616.6            |                            |                 |
| <b>Geotérmica</b>        | <b>2</b>           | <b>70,000</b>           | <b>359,506.0</b>   | <b>31,661.8</b> | <b>327,844.2</b>   |                            |                 |
| Patricio Argüello        | 2                  | 70,000                  | 359,506.0          | 31,661.8        | 327,844.2          |                            |                 |
| <b>Vapor</b>             | <b>5</b>           | <b>175,000</b>          | <b>761,067.6</b>   | <b>44,819.0</b> | <b>716,248.6</b>   | <b>0.0</b>                 | <b>56,674.3</b> |
| Nicaragua                | 2                  | 100,000                 | 699,298.0          | 35,750.4        | 663,547.6          |                            | 50,676.3        |
| Managua (Vapor)          | 3                  | 75,000                  | 61,769.6           | 9,068.6         | 52,701.0           |                            | 5,998.0         |
| <b>Turbogas</b>          | <b>2</b>           | <b>42,000</b>           | <b>115,453.5</b>   | <b>368.6</b>    | <b>115,084.9</b>   | <b>10,988.8</b>            | <b>0.0</b>      |
| José D. Estrada          | 1                  | 27,000                  | 109,786.0          | 324.6           | 109,461.4          | 10,297.0                   |                 |
| Germán Pomáres           | 1                  | 15,000                  | 5,667.5            | 44.0            | 5,623.5            | 691.8                      |                 |
| <b>Sistema Privado</b>   | <b>0</b>           | <b>0</b>                | <b>6,300.0</b>     | <b>0.0</b>      | <b>6,300.0</b>     | <b>0.0</b>                 | <b>0.0</b>      |
| Timal                    |                    |                         | 6,300.0            |                 | 6,300.0            |                            |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares.

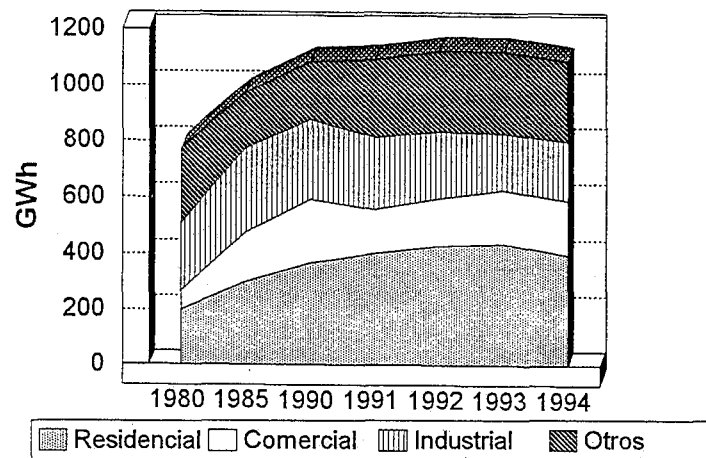
No se dispone de otros datos para Timal.

## NICARAGUA: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

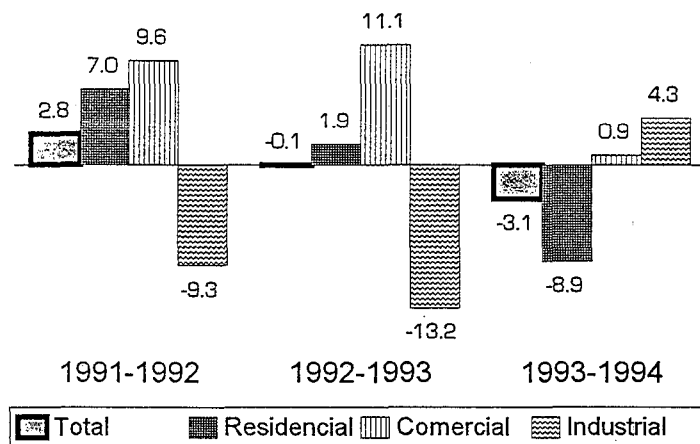
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | Comercial | Industrial | Otros |
|------|--------|-------------|-----------|------------|-------|
| 1980 | 774.7  | 201.2       | 66.4      | 241.3      | 265.8 |
| 1985 | 973.4  | 297.6       | 178.2     | 297.9      | 199.7 |
| 1990 | 1087.3 | 369.3       | 225.0     | 281.3      | 211.7 |
| 1991 | 1094.6 | 401.7       | 155.8     | 256.1      | 281.0 |
| 1992 | 1125.5 | 429.6       | 170.8     | 232.3      | 292.7 |
| 1993 | 1124.5 | 437.7       | 189.7     | 201.8      | 295.3 |
| 1994 | 1089.1 | 398.8       | 191.4     | 210.5      | 288.4 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 26.0        | 8.6       | 31.1       | 34.3  |
| 1985 | 100.0 | 30.6        | 18.3      | 30.6       | 20.5  |
| 1990 | 100.0 | 34.0        | 20.7      | 25.9       | 19.5  |
| 1991 | 100.0 | 36.7        | 14.2      | 23.4       | 25.7  |
| 1992 | 100.0 | 38.2        | 15.2      | 20.6       | 26.0  |
| 1993 | 100.0 | 38.9        | 16.9      | 17.9       | 26.3  |
| 1994 | 100.0 | 36.6        | 17.6      | 19.3       | 26.5  |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

Las variaciones en los sectores Comercial y Otros se deben a la desagregación total o parcial del bloque Gobierno en el Comercial.



## NICARAGUA: PRECIOS PROMEDIO

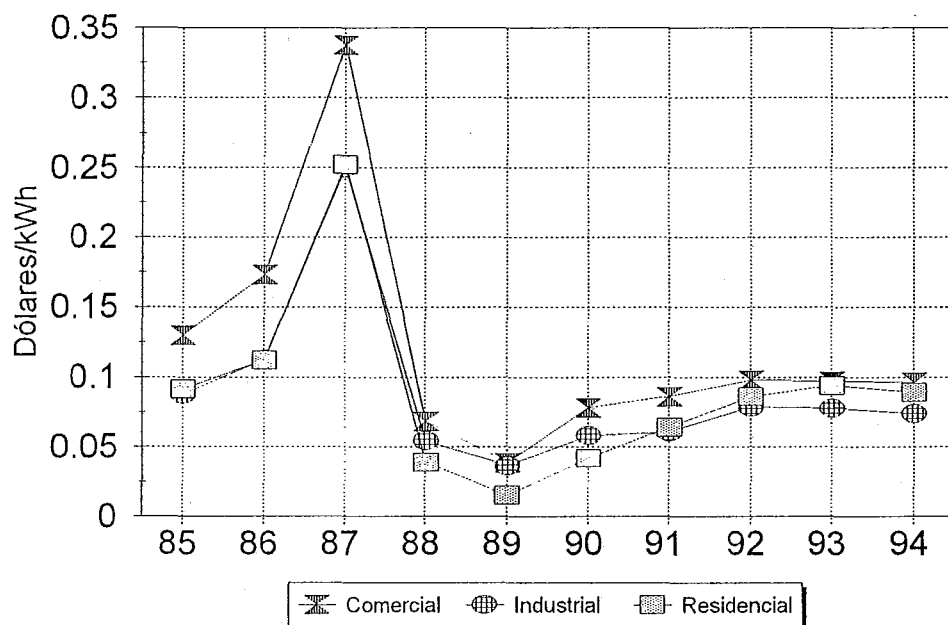
## EVOLUCION RECIENTE

Dólares/kWh

| AÑO  | RESIDENCIAL | COMERCIAL | INDUSTRIAL | CORDOBAS<br>POR DOLAR |
|------|-------------|-----------|------------|-----------------------|
| 1985 | 0.091       | 0.130     | 0.088      | 26.50                 |
| 1986 | 0.112       | 0.173     | 0.113      | 66.50                 |
| 1987 | 0.252       | 0.338     | 0.250      | 70.00                 |
| 1988 | 0.039       | 0.068     | 0.054      | 270.00                |
| 1989 | 0.015       | 0.039     | 0.037      | 15655.00              |
| 1990 | 0.042       | 0.078     | 0.058      | 1.00                  |
| 1991 | 0.064       | 0.086     | 0.061      | 4.85                  |
| 1992 | 0.086       | 0.098     | 0.078      | 5.00                  |
| 1993 | 0.094       | 0.097     | 0.077      | 6.12                  |
| 1994 | 0.089       | 0.096     | 0.074      | 6.72                  |

a/ Córdobas nuevos en 1988; córdobas oro a partir de 1990.

## EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Precios corrientes.

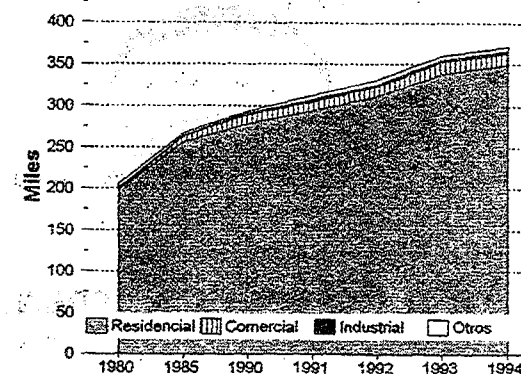
Debido a los cambios en la tasa de inflación, tasa de cambio y cambio de moneda, los resultados no son representativos de fenómenos reales.

# NICARAGUA: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

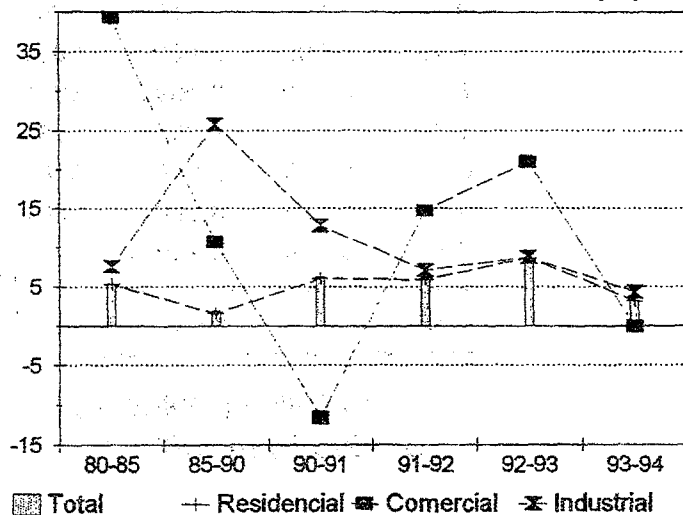
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |           |            |       | %           |           |            |       |
|------|-------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 205.5 | 198.3       | 1.3       | 0.6        | 5.4   | 96.5        | 0.6       | 0.3        | 2.6   |
| 1985 | 266.6 | 256.4       | 6.7       | 0.8        | 2.6   | 96.2        | 2.5       | 0.3        | 1.0   |
| 1990 | 293.7 | 277.5       | 11.2      | 2.6        | 2.4   | 94.5        | 3.8       | 0.9        | 0.8   |
| 1991 | 312.0 | 294.1       | 9.9       | 2.9        | 5.1   | 94.3        | 3.2       | 0.9        | 1.6   |
| 1992 | 331.3 | 311.4       | 11.4      | 3.1        | 5.5   | 94.0        | 3.4       | 0.9        | 1.7   |
| 1993 | 359.7 | 338.4       | 13.7      | 3.4        | 4.1   | 94.1        | 3.8       | 0.9        | 1.2   |
| 1994 | 371.0 | 349.3       | 13.7      | 3.5        | 4.5   | 94.1        | 3.7       | 1.0        | 1.2   |

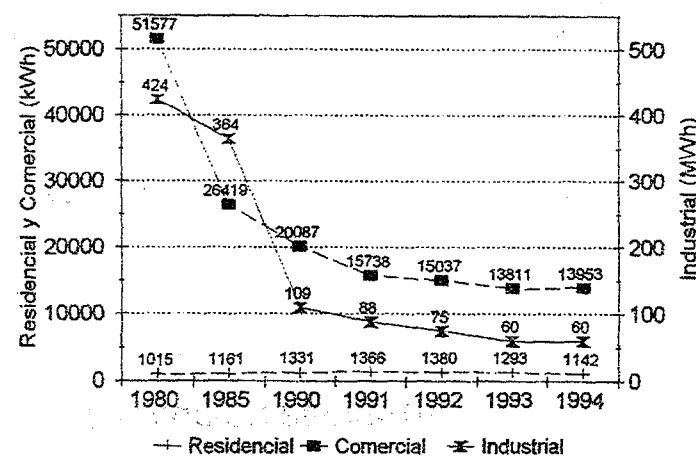
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

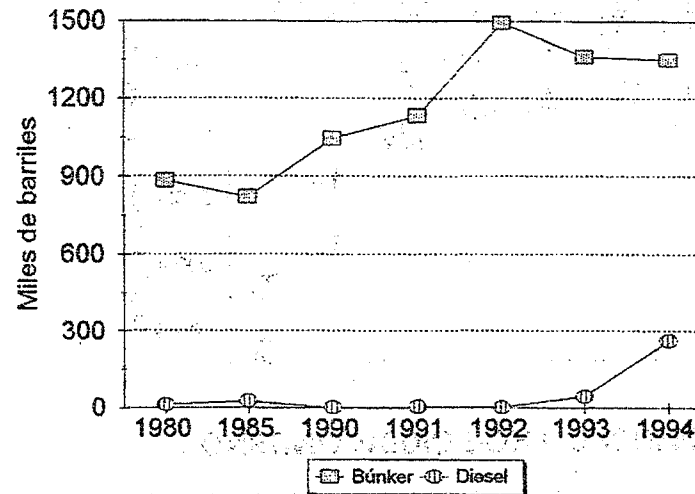
Las variaciones en los sectores Comercial y Otros se deben a la desagregación total o parcial del bloque Gobierno en el Comercial.

# NICARAGUA: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

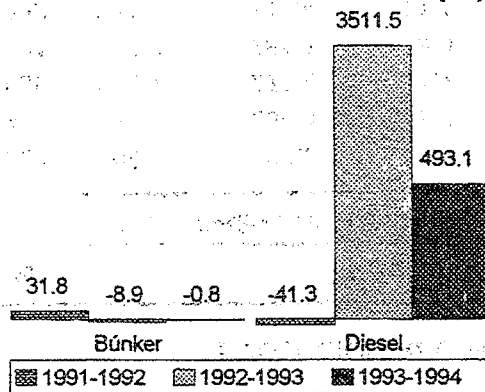
## EVOLUCION RECIENTE (Miles de barriles)

| Año  | Total  | Búnker | Diesel |
|------|--------|--------|--------|
| 1980 | 895.8  | 883.6  | 12.2   |
| 1985 | 846.8  | 821.4  | 25.5   |
| 1990 | 1043.8 | 1043.8 | 0.0    |
| 1991 | 1135.1 | 1133.0 | 2.1    |
| 1992 | 1494.3 | 1493.0 | 1.2    |
| 1993 | 1404.2 | 1360.1 | 44.1   |
| 1994 | 1611.0 | 1349.4 | 261.6  |

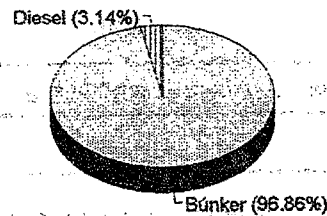
## EVOLUCION RECIENTE



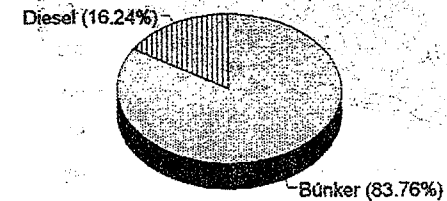
## TASAS DE CRECIMIENTO (%)



## COMBUSTIBLE UTILIZADO, 1993



## COMBUSTIBLE UTILIZADO, 1994



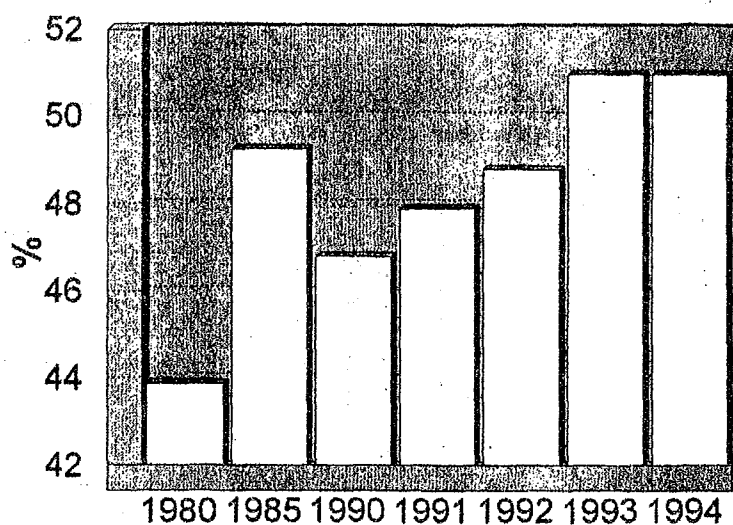
Fuente: CEPAL, sobre la base de cifras oficiales.  
Nota: Cifras preliminares para 1994.

## NICARAGUA: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Total de<br>viviendas<br>Miles | Clientes<br>residenciales<br>Miles | Indice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|------------------------------------|-----------------------------------|
| 1980 | 2,802              | 6.2                        | 451.9                          | 198.3                              | 43.9                              |
| 1985 | 3,229              | 6.2                        | 520.8                          | 256.4                              | 49.2                              |
| 1990 | 3,676              | 6.2                        | 592.9                          | 277.5                              | 46.8                              |
| 1991 | 3,808              | 6.2                        | 614.2                          | 294.1                              | 47.9                              |
| 1992 | 3,957              | 6.2                        | 638.2                          | 311.4                              | 48.8                              |
| 1993 | 4,117              | 6.2                        | 664.0                          | 338.4                              | 51.0                              |
| 1994 | 4,249              | 6.2                        | 685.3                          | 349.3                              | 51.0                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

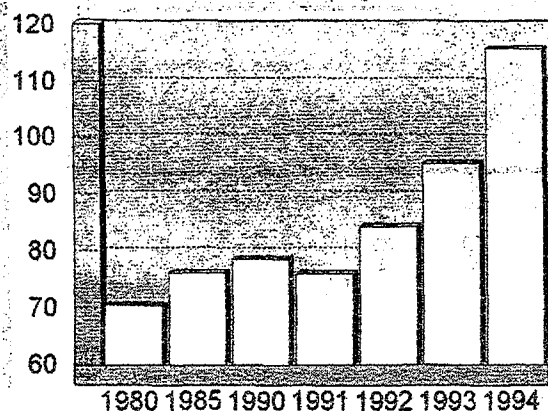
Nota: Cifras preliminares para 1994.

## NICARAGUA: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

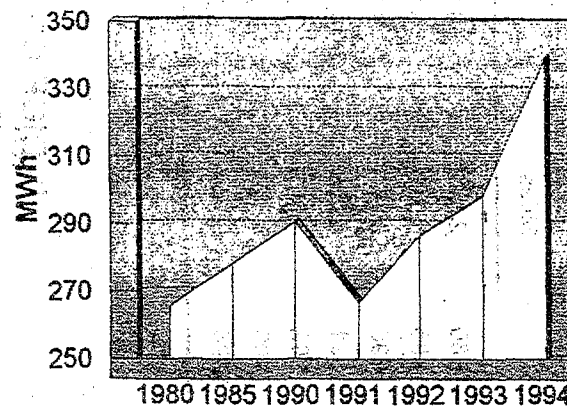
### EVOLUCION RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | 2,917     |                                    | 205.5                               | 70.5                            | 774.7               | 265.6                                     |
| 1985 | 3,502     | 3.72                               | 266.6                               | 76.1                            | 973.4               | 278.0                                     |
| 1990 | 3,743     | 1.34                               | 293.7                               | 78.5                            | 1087.3              | 290.5                                     |
| 1991 | 4,106     | 9.70                               | 312.0                               | 76.0                            | 1094.6              | 266.6                                     |
| 1992 | 3,932     | -4.24                              | 331.3                               | 84.3                            | 1125.5              | 286.2                                     |
| 1993 | 3,770     | -4.12                              | 359.7                               | 95.4                            | 1124.5              | 298.3                                     |
| 1994 | 3,207     | -14.93                             | 371.0                               | 115.7                           | 1089.1              | 339.6                                     |

**USUARIOS POR EMPLEADO  
EVOLUCION RECIENTE**



**ENERGIA VENDIDA POR EMPLEADO  
EVOLUCION RECIENTE**



Fuente: CEPAL, sobre la base de cifras oficiales.

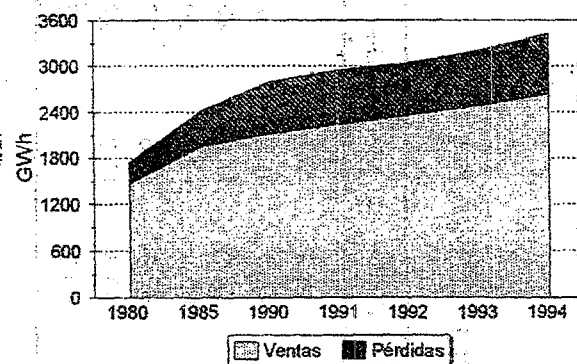
Notas: Cifras preliminares para 1994.

La fuente de información para el número de empleados en 1980 y 1985 es el Banco Mundial.

## PANAMA: OFERTA-DEMANDA DE POTENCIA Y SUMINISTRO DE ENERGIA ELECTRICA

| Año  | MW                  |                | GWh                     |             |             |         |             |               | %      |          |                 |
|------|---------------------|----------------|-------------------------|-------------|-------------|---------|-------------|---------------|--------|----------|-----------------|
|      | Capacidad instalada | Demanda máxima | Generación neta pública | Exportación | Importación | Compras | Disponibles | Racionamiento | Ventas | Pérdidas | Factor de carga |
| 1980 | 519.1               | 306            | 1743.9                  | 0.0         | 0.0         | 2.1     | 1746.0      | n.d.          | 1472.4 | 15.7     | 65.1            |
| 1985 | 852.7               | 424            | 2378.2                  | 1.3         | 0.4         | 29.6    | 2406.9      | n.d.          | 1944.1 | 19.2     | 64.8            |
| 1990 | 883.4               | 464            | 2624.8                  | 28.7        | 118.6       | 83.9    | 2798.6      | n.d.          | 2114.1 | 24.5     | 68.9            |
| 1991 | 883.4               | 489            | 2750.4                  | 10.5        | 111.3       | 96.5    | 2947.7      | 6.0           | 2239.3 | 24.0     | 68.8            |
| 1992 | 883.4               | 518            | 2854.5                  | 18.0        | 45.3        | 165.8   | 3047.6      | 15.0          | 2355.1 | 22.7     | 67.2            |
| 1993 | 912.4               | 541            | 3098.4                  | 22.4        | 19.0        | 109.8   | 3204.8      | -             | 2484.5 | 22.5     | 67.6            |
| 1994 | 910.4               | 592            | 3307.0                  | 81.1        | 57.4        | 153.1   | 3436.5      | -             | 2635.7 | 23.3     | 66.3            |

DISTRIBUCION DE LA ENERGIA DISPONIBLE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las columnas de importación y exportación corresponden a intercambios de energía con otros países.

Las compras corresponden a transacciones internas en el país con otras empresas.

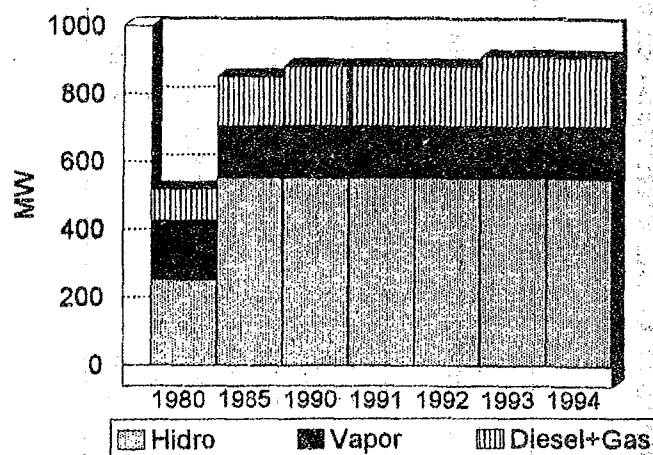
Las pérdidas corresponden a transmisión y distribución.

## PANAMA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA CAPACIDAD INSTALADA

### EVOLUCION RECIENTE (MW)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 519.1 | 250.8 | 175.2 | 93.2       |
| 1985 | 852.7 | 550.8 | 155.5 | 146.4      |
| 1990 | 883.4 | 550.8 | 155.5 | 177.1      |
| 1991 | 883.4 | 550.8 | 155.5 | 177.1      |
| 1992 | 883.4 | 550.8 | 155.5 | 177.1      |
| 1993 | 912.4 | 550.8 | 155.5 | 206.1      |
| 1994 | 910.4 | 550.8 | 155.5 | 204.1      |

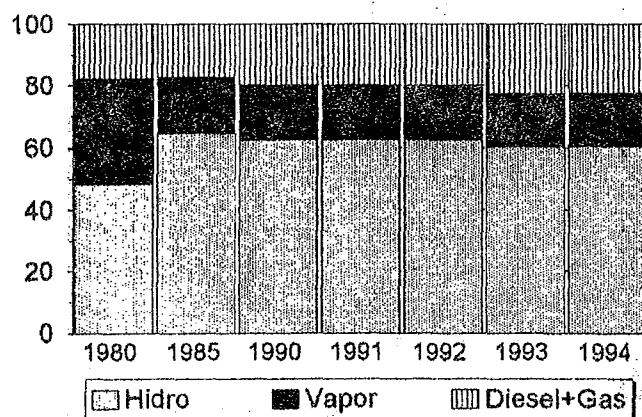
### EVOLUCION RECIENTE



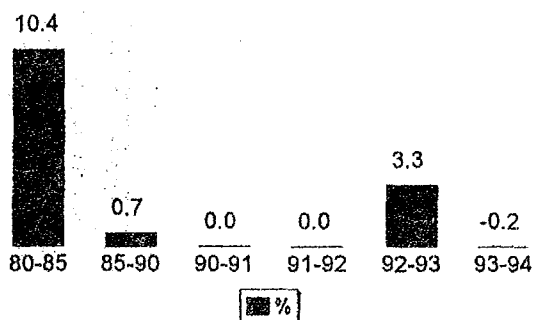
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 100.0 | 48.3  | 33.7  | 17.9       |
| 1985 | 100.0 | 64.6  | 18.2  | 17.2       |
| 1990 | 100.0 | 62.4  | 17.6  | 20.0       |
| 1991 | 100.0 | 62.4  | 17.6  | 20.0       |
| 1992 | 100.0 | 62.4  | 17.6  | 20.0       |
| 1993 | 100.0 | 60.4  | 17.0  | 22.6       |
| 1994 | 100.0 | 60.5  | 17.1  | 22.4       |

### ESTRUCTURA (%)



### TASAS DE CRECIMIENTO ANUALES



Fuente: CEPAL, sobre la base de cifras oficiales.

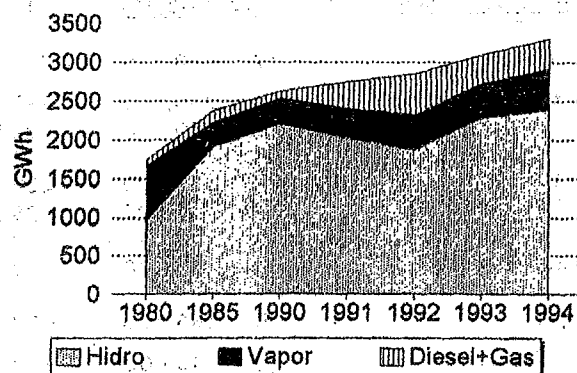
Nota: Cifras preliminares para 1994.

## PANAMA: EVOLUCION, ESTRUCTURA Y CRECIMIENTO DE LA GENERACION NETA

### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Hidro  | Vapor | Diesel+Gas |
|------|--------|--------|-------|------------|
| 1980 | 1743.9 | 959.7  | 718.7 | 65.6       |
| 1985 | 2378.2 | 1918.5 | 312.3 | 147.5      |
| 1990 | 2624.8 | 2206.0 | 326.2 | 92.6       |
| 1991 | 2750.4 | 2029.8 | 375.3 | 345.3      |
| 1992 | 2854.5 | 1884.0 | 443.6 | 527.0      |
| 1993 | 3098.4 | 2287.1 | 448.7 | 362.5      |
| 1994 | 3307.0 | 2383.2 | 540.2 | 383.7      |

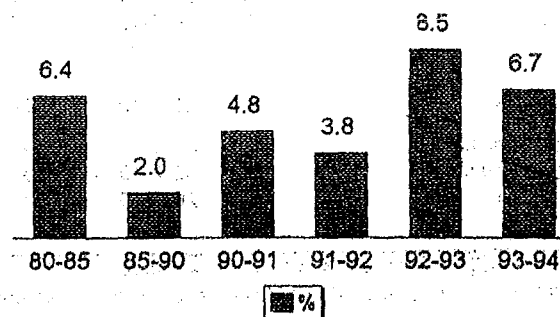
### EVOLUCION RECIENTE



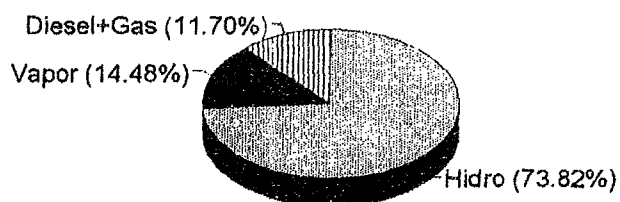
### ESTRUCTURA (%)

| Año  | Total | Hidro | Vapor | Diesel+Gas |
|------|-------|-------|-------|------------|
| 1980 | 100.0 | 55.0  | 41.2  | 3.8        |
| 1985 | 100.0 | 80.7  | 13.1  | 6.2        |
| 1990 | 100.0 | 84.0  | 12.4  | 3.5        |
| 1991 | 100.0 | 73.8  | 13.6  | 12.6       |
| 1992 | 100.0 | 66.0  | 15.5  | 18.5       |
| 1993 | 100.0 | 73.8  | 14.5  | 11.7       |
| 1994 | 100.0 | 72.1  | 16.3  | 11.6       |

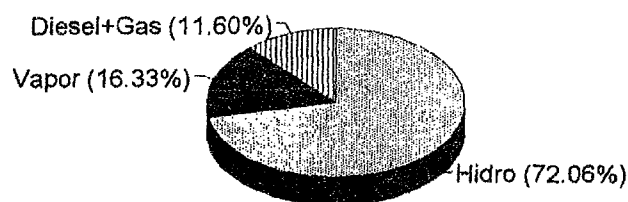
### TASAS DE CRECIMIENTO ANUALES



### ESTRUCTURA EN 1993



### ESTRUCTURA EN 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.



## PANAMA: CENTRALES ELECTRICAS EN OPERACION, 1993

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |                 |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|-----------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        | Diesel marino   |
| <b>Sistema Integrado</b> | <b>44</b>          | <b>912,410</b>          | <b>3,136,164.2</b> | <b>37,781.2</b> | <b>3,098,383.0</b> | <b>20,228.0</b>            | <b>43,374.3</b> | <b>15,067.1</b> |
| <b>Hidráulica</b>        | <b>17</b>          | <b>550,810</b>          | <b>2,294,512.0</b> | <b>7,382.3</b>  | <b>2,287,129.7</b> |                            |                 |                 |
| Fortuna                  | 3                  | 300,000                 | 1,237,483.0        | 3,911.9         | 1,233,571.1        |                            |                 |                 |
| Bayano                   | 2                  | 150,000                 | 524,548.0          | 987.1           | 523,560.9          |                            |                 |                 |
| Los Valles               | 2                  | 48,000                  | 264,065.7          | 1,227.9         | 262,837.8          |                            |                 |                 |
| La Estrella              | 2                  | 42,000                  | 223,902.1          | 1,212.2         | 222,689.9          |                            |                 |                 |
| La Yeguada               | 3                  | 7,000                   | 28,232.3           | 43.2            | 28,189.1           |                            |                 |                 |
| Dolega                   | 4                  | 3,040                   | 12,927.5           |                 | 12,927.5           |                            |                 |                 |
| Macho de Monte           | 1                  | 770                     | 3,353.4            |                 | 3,353.4            |                            |                 |                 |
| <b>Vapor</b>             | <b>5</b>           | <b>155,500</b>          | <b>477,344.5</b>   | <b>28,629.5</b> | <b>448,715.0</b>   | <b>0.0</b>                 | <b>42,965.6</b> | <b>0.0</b>      |
| 9 de Enero 3             | 1                  | 40,000                  | 178,915.0          | 10,088.1        | 168,826.9          |                            | 14,705.9        |                 |
| 9 de Enero 4             | 1                  | 40,000                  | 172,177.6          | 8,808.7         | 163,368.9          |                            | 15,944.5        |                 |
| 9 de Enero 2             | 1                  | 40,000                  |                    |                 |                    |                            |                 |                 |
| 9 de Enero 1             | 1                  | 24,000                  | 59,789.9           | 3,737.0         | 56,052.9           |                            | 5,193.3         |                 |
| San Francisco (V)        | 1                  | 11,500                  | 66,462.0           | 6,195.7         | 60,266.3           |                            | 7,121.9         |                 |
| <b>Diesel</b>            | <b>17</b>          | <b>83,300</b>           | <b>88,133.3</b>    | <b>559.7</b>    | <b>87,573.6</b>    | <b>6,045.8</b>             | <b>408.7</b>    | <b>0.0</b>      |
| 9 de Enero 7             | 1                  | 29,000                  | 71,530.6           |                 | 71,530.6           | 5,279.8                    |                 |                 |
| Pielstick                | 4                  | 28,200                  | 7,497.8            | 439.2           | 7,058.6            |                            | 408.7           |                 |
| Chitré                   | 6                  | 16,500                  | 1,804.7            | 58.5            | 1,746.2            | 147.8                      |                 |                 |
| Capira                   | 6                  | 9,600                   | 7,300.2            | 62.0            | 7,238.2            | 618.2                      |                 |                 |
| <b>Turbogas</b>          | <b>5</b>           | <b>122,800</b>          | <b>276,174.4</b>   | <b>1,209.7</b>  | <b>274,964.7</b>   | <b>14,182.2</b>            | <b>0.0</b>      | <b>15,067.1</b> |
| 9 de Enero JBG           | 2                  | 60,000                  | 146,192.8          | 1,003.5         | 145,189.3          |                            |                 | 15,067.1        |
| Sub-Est Panamá           | 2                  | 42,800                  | 86,418.4           | 127.5           | 86,290.9           | 9,302.2                    |                 |                 |
| Mt. Hope                 | 1                  | 20,000                  | 43,563.2           | 78.7            | 43,484.5           | 4,880.0                    |                 |                 |

Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: No se dispone de datos desagregados recientes para las plantas del área del canal.

## PANAMA: CENTRALES ELECTRICAS EN OPERACION, 1994

| Tipo/Nombre              | Número de Unidades | Potencia Instalada (kW) | (MWh)              |                 |                    | Consumo (Miles de galones) |                 |               |
|--------------------------|--------------------|-------------------------|--------------------|-----------------|--------------------|----------------------------|-----------------|---------------|
|                          |                    |                         | Generación bruta   | Consumo propio  | Generación neta    | Diesel                     | Fuel Oil        | Diesel marino |
| <b>Sistema Integrado</b> | <b>43</b>          | <b>910,410</b>          | <b>3,348,901.3</b> | <b>41,859.9</b> | <b>3,307,041.4</b> | <b>35,997.8</b>            | <b>48,939.7</b> | <b>0.0</b>    |
| <b>Hidráulica</b>        | <b>17</b>          | <b>550,810</b>          | <b>2,390,862.0</b> | <b>7,672.6</b>  | <b>2,383,189.4</b> |                            |                 |               |
| Fortuna                  | 3                  | 300,000                 | 1,351,375.4        | 4,393.2         | 1,346,982.2        |                            |                 |               |
| Bayano                   | 2                  | 150,000                 | 557,460.0          | 1,037.3         | 556,422.7          |                            |                 |               |
| Los Valles               | 2                  | 48,000                  | 229,717.7          | 1,083.4         | 228,634.3          |                            |                 |               |
| La Estrella              | 2                  | 42,000                  | 207,918.8          | 1,115.9         | 206,802.9          |                            |                 |               |
| La Yeguada               | 3                  | 7,000                   | 30,780.9           | 42.8            | 30,738.1           |                            |                 |               |
| Dolega                   | 4                  | 3,040                   | 9,780.7            |                 | 9,780.7            |                            |                 |               |
| Macho de Monte           | 1                  | 770                     | 3,828.5            |                 | 3,828.5            |                            |                 |               |
| <b>Vapor</b>             | <b>5</b>           | <b>155,500</b>          | <b>573,241.5</b>   | <b>33,074.2</b> | <b>540,167.3</b>   | <b>0.0</b>                 | <b>48,542.8</b> | <b>0.0</b>    |
| 9 de Enero 3             | 1                  | 40,000                  | 199,676.0          | 10,717.0        | 188,959.0          |                            | 16,369.5        |               |
| 9 de Enero 4             | 1                  | 40,000                  | 191,597.2          | 9,577.6         | 182,019.6          |                            | 16,056.2        |               |
| 9 de Enero 2             | 1                  | 40,000                  |                    |                 |                    |                            |                 |               |
| 9 de Enero 1             | 1                  | 24,000                  | 114,542.3          | 6,542.1         | 108,000.2          |                            | 8,888.5         |               |
| San Francisco (V)        | 1                  | 11,500                  | 67,426.0           | 6,237.5         | 61,188.5           |                            | 7,228.6         |               |
| <b>Diesel</b>            | <b>16</b>          | <b>81,300</b>           | <b>153,636.3</b>   | <b>757.7</b>    | <b>152,878.6</b>   | <b>10,829.3</b>            | <b>396.9</b>    | <b>0.0</b>    |
| 9 de Enero 7             | 1                  | 29,000                  | 121,707.8          |                 | 121,707.8          | 8,781.4                    |                 |               |
| Pielstick                | 4                  | 28,200                  | 8,768.8            | 538.2           | 8,230.6            | 173.5                      | 396.9           |               |
| Chiré                    | 5                  | 14,500                  | 9,483.2            | 124.5           | 9,358.7            | 782.0                      |                 |               |
| Capira                   | 6                  | 9,600                   | 13,676.5           | 95.0            | 13,581.5           | 1,092.4                    |                 |               |
| <b>Turbogas</b>          | <b>5</b>           | <b>122,800</b>          | <b>231,161.5</b>   | <b>355.4</b>    | <b>230,806.1</b>   | <b>25,168.5</b>            | <b>0.0</b>      | <b>0.0</b>    |
| 9 de Enero JBG           | 2                  | 60,000                  |                    |                 |                    |                            |                 |               |
| Sub-Est Panamá           | 2                  | 42,800                  | 142,857.8          | 219.2           | 142,638.6          | 15,350.2                   |                 |               |
| Mt. Hope                 | 1                  | 20,000                  | 88,303.7           | 136.2           | 88,167.5           | 9,818.3                    |                 |               |

Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares.

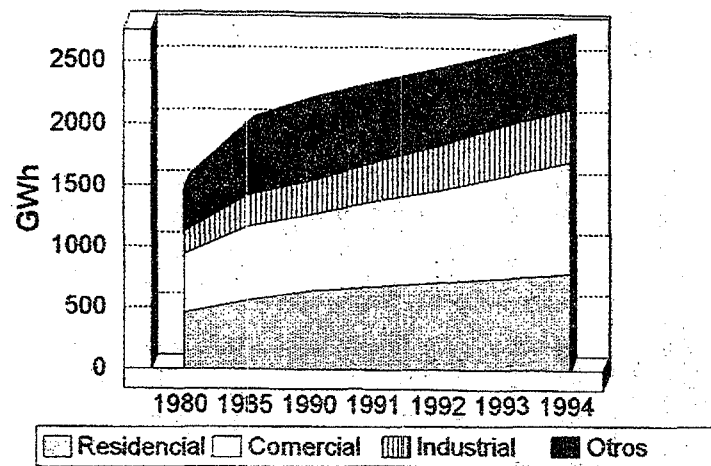
No se dispone de datos desagregados recientes para las plantas del área del canal.

## PANAMA: EVOLUCION DE LAS VENTAS DE ENERGIA ELECTRICA POR SECTORES DE CONSUMO

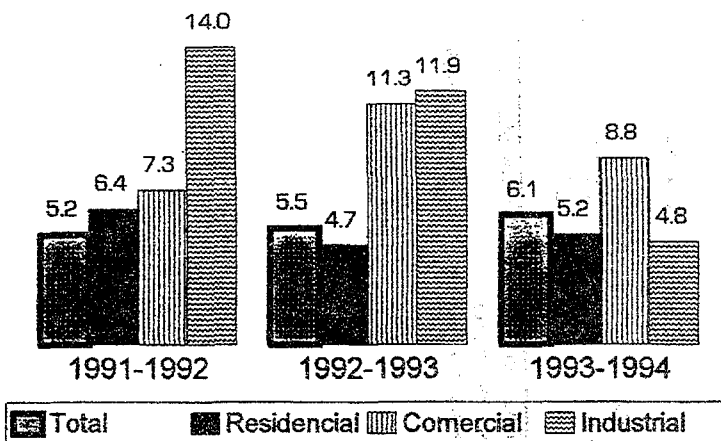
### EVOLUCION RECIENTE (GWh)

| Año  | Total  | Residencial | Comercial | Industrial | Otros |
|------|--------|-------------|-----------|------------|-------|
| 1980 | 1472.4 | 457.0       | 479.2     | 184.4      | 351.7 |
| 1985 | 1944.1 | 559.6       | 609.8     | 252.4      | 522.3 |
| 1990 | 2114.1 | 637.3       | 633.6     | 276.5      | 566.6 |
| 1991 | 2239.3 | 673.4       | 703.0     | 321.1      | 541.7 |
| 1992 | 2355.1 | 716.3       | 754.1     | 366.2      | 518.5 |
| 1993 | 2484.5 | 749.8       | 839.6     | 409.9      | 485.2 |
| 1994 | 2635.7 | 788.5       | 913.1     | 429.7      | 504.4 |

### EVOLUCION RECIENTE



### TASAS DE CRECIMIENTO (%)



### ESTRUCTURA (%)

| Año  | Total | Residencial | Comercial | Industrial | Otros |
|------|-------|-------------|-----------|------------|-------|
| 1980 | 100.0 | 31.0        | 32.5      | 12.5       | 23.9  |
| 1985 | 100.0 | 28.8        | 31.4      | 13.0       | 26.9  |
| 1990 | 100.0 | 30.1        | 30.0      | 13.1       | 26.8  |
| 1991 | 100.0 | 30.1        | 31.4      | 14.3       | 24.2  |
| 1992 | 100.0 | 30.4        | 32.0      | 15.5       | 22.0  |
| 1993 | 100.0 | 30.2        | 33.8      | 16.5       | 19.5  |
| 1994 | 100.0 | 29.9        | 34.6      | 16.3       | 19.1  |

Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

Las cifras corresponden a las ventas totales.

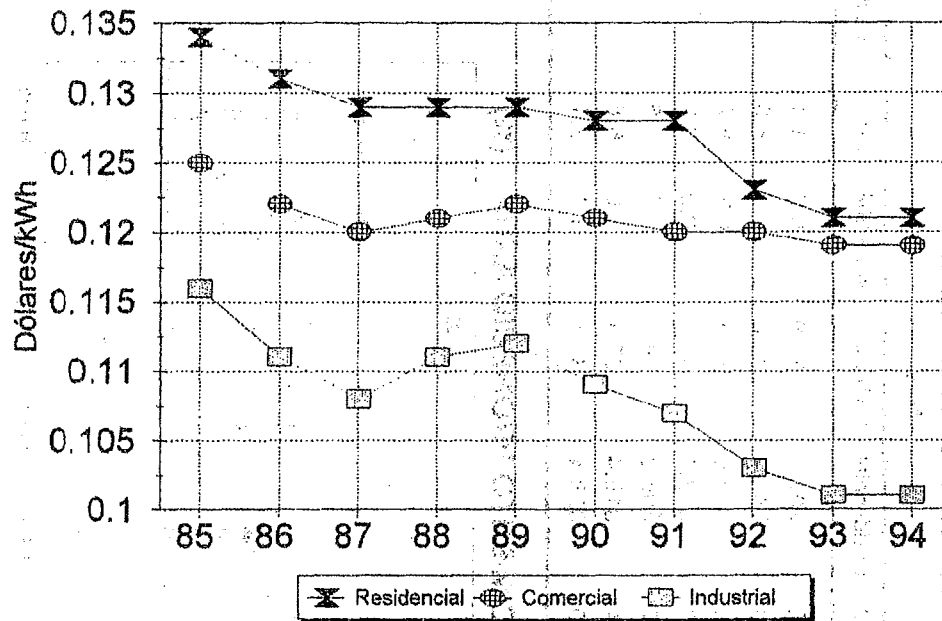
## PANAMA: PRECIOS PROMEDIO

### EVOLUCION RECIENTE

Dólares/kWh

| ANO  | RESIDENCIAL | COMERCIAL | INDUSTRIAL | BALBOAS<br>POR DOLAR |
|------|-------------|-----------|------------|----------------------|
| 1985 | 0.134       | 0.125     | 0.116      | 1.00                 |
| 1986 | 0.131       | 0.122     | 0.111      | 1.00                 |
| 1987 | 0.129       | 0.120     | 0.108      | 1.00                 |
| 1988 | 0.129       | 0.121     | 0.111      | 1.00                 |
| 1989 | 0.129       | 0.122     | 0.112      | 1.00                 |
| 1990 | 0.128       | 0.121     | 0.109      | 1.00                 |
| 1991 | 0.128       | 0.120     | 0.107      | 1.00                 |
| 1992 | 0.123       | 0.120     | 0.103      | 1.00                 |
| 1993 | 0.121       | 0.119     | 0.101      | 1.00                 |
| 1994 | 0.121       | 0.119     | 0.101      | 1.00                 |

### EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

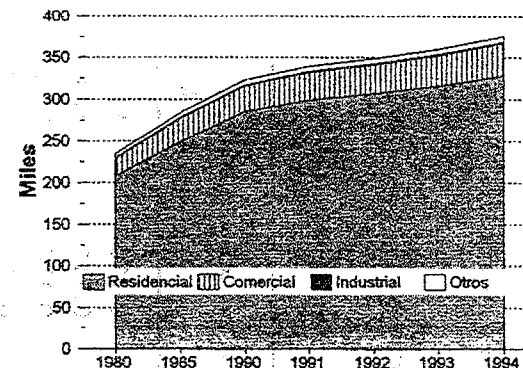
Precios corrientes.

# PANAMA: USUARIOS DE ENERGIA ELECTRICA POR SECTOR DE CONSUMO

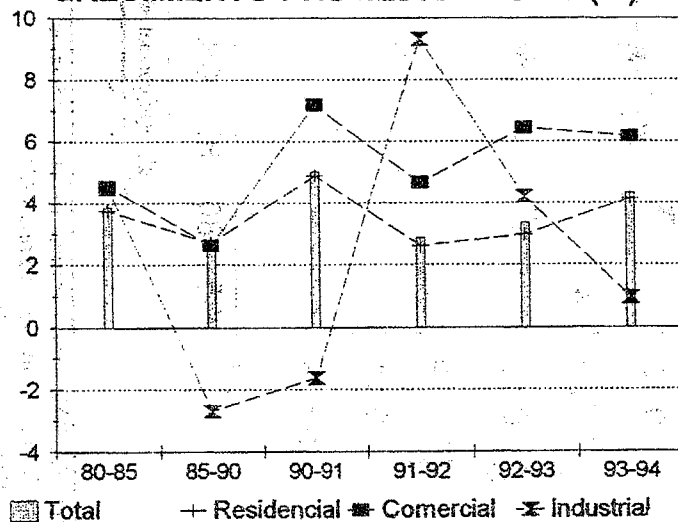
## EVOLUCION RECIENTE Y COMPOSICION PORCENTUAL

| Año  | Miles |             |           |            |       | %           |           |            |       |
|------|-------|-------------|-----------|------------|-------|-------------|-----------|------------|-------|
|      | Total | Residencial | Comercial | Industrial | Otros | Residencial | Comercial | Industrial | Otros |
| 1980 | 234.2 | 207.4       | 21.9      | 0.9        | 4.1   | 88.5        | 9.3       | 0.4        | 1.8   |
| 1985 | 282.9 | 249.2       | 27.3      | 1.1        | 5.3   | 88.1        | 9.7       | 0.4        | 1.9   |
| 1990 | 322.8 | 284.6       | 31.1      | 0.9        | 6.2   | 88.2        | 9.6       | 0.3        | 1.9   |
| 1991 | 339.0 | 298.5       | 33.3      | 0.9        | 6.3   | 88.1        | 9.8       | 0.3        | 1.8   |
| 1992 | 348.7 | 306.3       | 34.9      | 1.0        | 6.6   | 87.8        | 10.0      | 0.3        | 1.9   |
| 1993 | 360.4 | 315.4       | 37.1      | 1.0        | 6.8   | 87.5        | 10.3      | 0.3        | 1.9   |
| 1994 | 376.0 | 328.4       | 39.4      | 1.1        | 7.1   | 87.4        | 10.5      | 0.3        | 1.9   |

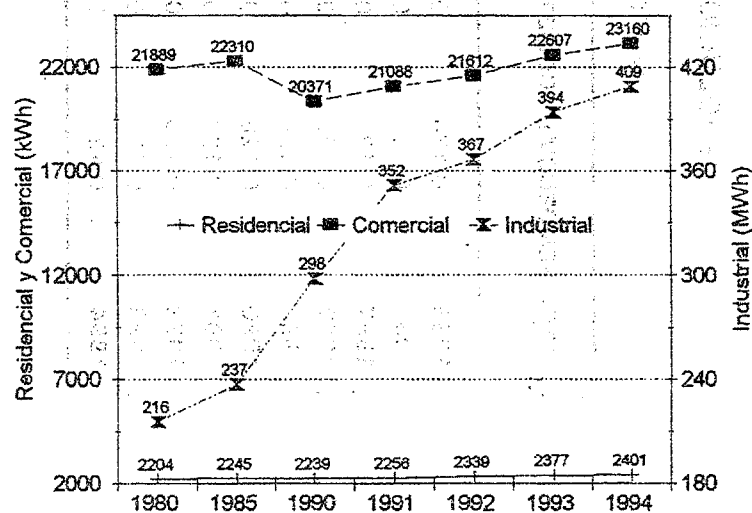
## EVOLUCION RECIENTE



## CRECIMIENTO PROMEDIO ANUAL (%)



## CONSUMO MEDIO POR CONSUMIDOR



Fuente: CEPAL, sobre la base de cifras oficiales.

Notas: Cifras preliminares para 1994.

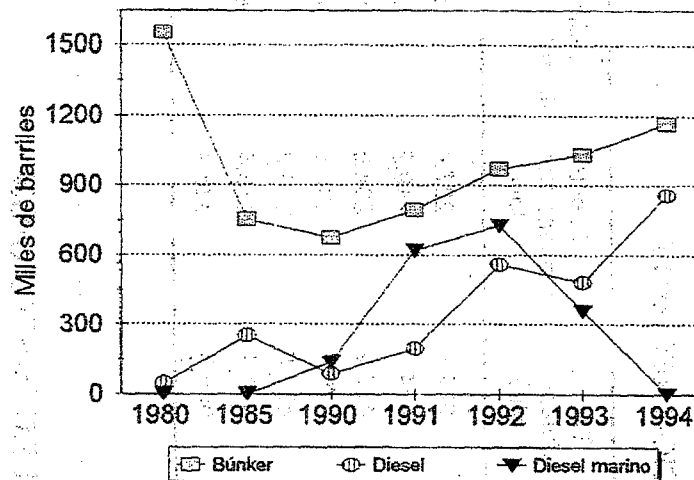
Las cifras corresponden a las ventas totales.

# PANAMA: CONSUMO DE COMBUSTIBLES PARA GENERACION DE ENERGIA ELECTRICA

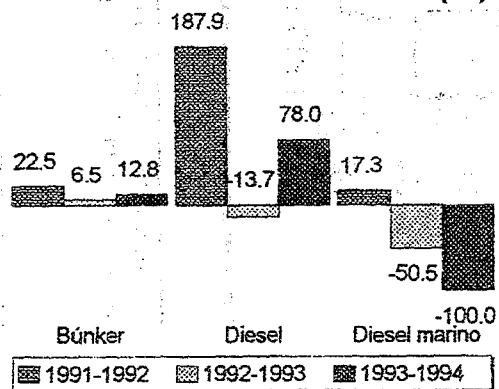
## EVOLUCION RECIENTE (Miles de barriles)

| Año  | Total  | Búnker | Diesel | Diesel marino |
|------|--------|--------|--------|---------------|
| 1980 | 1597.8 | 1550.0 | 47.8   | 0.0           |
| 1985 | 1001.5 | 751.1  | 250.3  | 0.0           |
| 1990 | 895.3  | 673.1  | 85.1   | 137.1         |
| 1991 | 1603.8 | 791.8  | 193.8  | 618.1         |
| 1992 | 2252.9 | 970.0  | 557.9  | 725.0         |
| 1993 | 1873.1 | 1032.7 | 481.6  | 358.7         |
| 1994 | 2022.3 | 1165.2 | 857.1  | 0.0           |

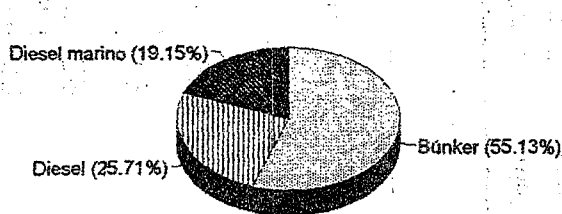
## EVOLUCION RECIENTE



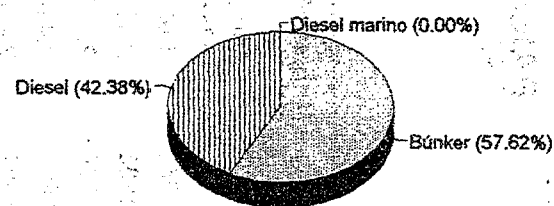
## TASAS DE CRECIMIENTO (%)



## COMBUSTIBLE UTILIZADO, 1993



## COMBUSTIBLE UTILIZADO, 1994



Fuente: CEPAL, sobre la base de cifras oficiales.

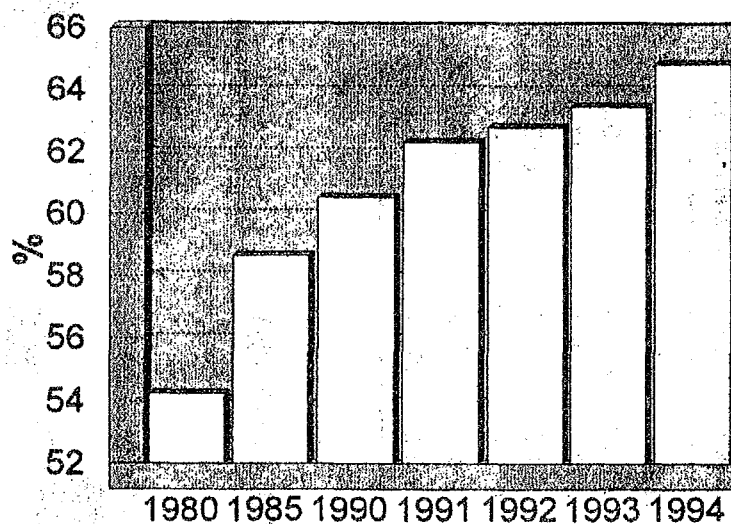
Nota: Cifras preliminares para 1994.

## PANAMA: INDICE DE ELECTRIFICACION

### EVOLUCION RECIENTE

|      | Población<br>Miles | Habitantes<br>por vivienda | Total de<br>viviendas<br>Miles | Clientes<br>residenciales<br>Miles | Indice de<br>electrificación<br>% |
|------|--------------------|----------------------------|--------------------------------|------------------------------------|-----------------------------------|
| 1980 | 1,950              | 5.1                        | 382.4                          | 207.4                              | 54.2                              |
| 1985 | 2,167              | 5.1                        | 424.9                          | 249.2                              | 58.7                              |
| 1990 | 2,398              | 5.1                        | 470.2                          | 284.6                              | 60.5                              |
| 1991 | 2,444              | 5.1                        | 479.2                          | 298.5                              | 62.3                              |
| 1992 | 2,488              | 5.1                        | 487.8                          | 306.3                              | 62.8                              |
| 1993 | 2,535              | 5.1                        | 497.1                          | 315.4                              | 63.5                              |
| 1994 | 2,583              | 5.1                        | 506.5                          | 328.4                              | 64.9                              |

### INDICE DE ELECTRIFICACION: EVOLUCION RECIENTE



Fuente: CEPAL, sobre la base de cifras oficiales.

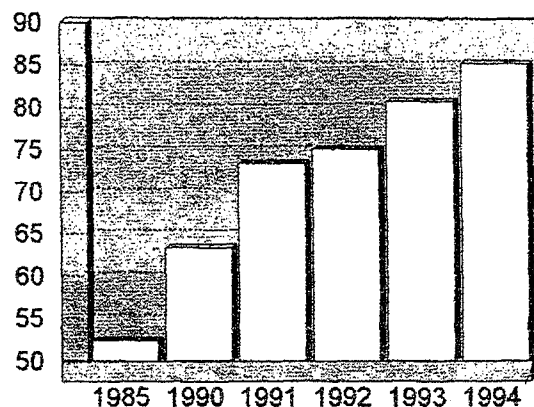
Nota: Cifras preliminares para 1994.

## PANAMA: EMPLEADOS EN LA INDUSTRIA ELECTRICA Y SUS INDICADORES DE DESEMPEÑO ASOCIADOS

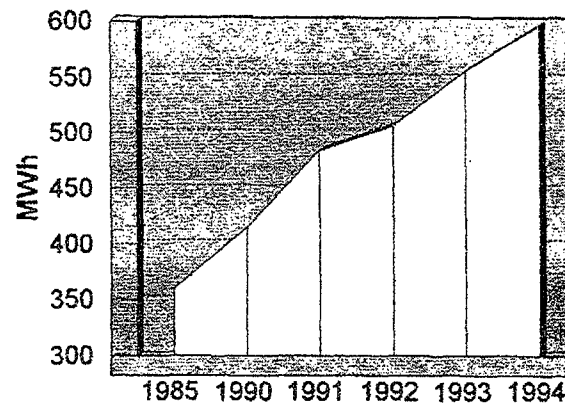
### EVOLUCION RECIENTE

|      | Empleados | Tasa de crecimiento promedio anual | Usuarios de energía eléctrica Miles | Usuarios atendidos por empleado | Energía vendida GWh | Energía vendida por empleado MWh/empleado |
|------|-----------|------------------------------------|-------------------------------------|---------------------------------|---------------------|---|
| 1980 | n.d.      |                                    | 234.2                               |                                 | 1472.4              |   |
| 1985 | 5,397     |                                    | 282.9                               | 52.4                            | 1944.1              | 360.2                                     |
| 1990 | 5,097     | -1.14                              | 322.8                               | 63.3                            | 2114.1              | 414.8                                     |
| 1991 | 4,621     | -9.34                              | 339.0                               | 73.4                            | 2239.3              | 484.6                                     |
| 1992 | 4,644     | 0.50                               | 348.7                               | 75.1                            | 2355.1              | 507.1                                     |
| 1993 | 4,464     | -3.88                              | 360.4                               | 80.7                            | 2484.5              | 556.6                                     |
| 1994 | 4,415     | -1.10                              | 376.0                               | 85.2                            | 2635.7              | 597.0                                     |

**USUARIOS POR EMPLEADO  
EVOLUCION RECIENTE**



**ENERGIA VENDIDA POR EMPLEADO  
EVOLUCION RECIENTE**



Fuente: CEPAL, sobre la base de cifras oficiales.

Nota: Cifras preliminares para 1994.